March 1925

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AMERICAN FRUIT GROWER MAGAZINE

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Apple Aphids and Their Control

By W. P. Flint
Illinois Natural History Survey

THE BEST methods and materials to use in the control of apple aphids are not as well established as those for the control of many of our other orchard insects, but with our present knowledge of this subject, a fair degree of commercial control can be obtained during most seasons. Anyone who has attended meetings of orchardists in any of the large apple growing states of the East during the past few years has probably frequently heard such questions as follows:

Will this be an aphis year?

Will oil sprays control apple aphids?

Will it pay me to spray for aphids this season?

Can I control apple aphids with an application of lime-sulphur and nicotine in delayed dormant?

Will it pay me to spray for aphis each season?

The fact that such questions are asked at nearly every horticultural meeting is evidence in itself that our methods of controlling aphis are not all that is desired. We certainly have not recently heard an orchardist say, "Will it pay me to spray for codling moth, or should I spray for scab this season?" Every orchardist understands that he must spray for certain orchard insects and diseases, but the apple aphid is an insect that fluctuates greatly in numbers from year to year, and the amount of damage done varies to such an extent that it is often a question of whether the treatment will not cost more than the amount saved.

Perhaps the aphis problem, and what can be done in the way of control, may best be brought out by attempting to answer certain questions which are frequently asked by orchardists concerning these insects.

How Many Kinds of Aphids Are of Importance in Eastern Apple Orchards?

There are three aphids which are nearly always present in the apple orchards east of the Rocky Mountains in sufficient numbers so that they may be considered of importance. These are the oat or grain aphis, the green apple aphis, and the rosy aphis.

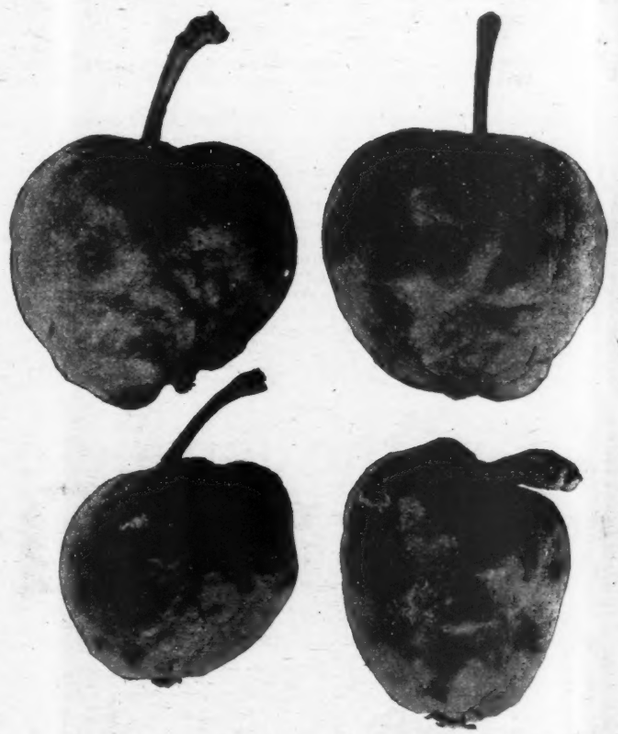
Of these aphids, the rosy aphis is generally considered the most important, as its feeding produces a more marked effect upon the fruit. Next in importance is the green apple aphis, and of least importance, the oat aphis.

How Do Aphis Feed?

All species of aphis feed by drawing the sap out of their food plants through a tiny beak attached to the underside of the head.

How Do the Different Species of Aphis Occurring in the Apple Orchards Differ in Their Life Habits?

All three species of aphis above mentioned go through the winter in the egg stage attached to the bark of twigs, water sprouts, and small branches of the apple and some other trees. In most cases, the eggs are deposited around some irregularity of the bark, such as bud scars or old wounds in the bark. In the spring, the eggs of the oat aphis usually start hatching about the time that the tips of the leaf buds begin to spread and show a light tinge of green. The eggs of this species nearly all hatch in a short time, and most of these aphis will be found on the buds within four or five days of the time the eggs start hatching. The eggs of the rosy aphis begin hatching about the same time but continue to hatch for a much longer period, sometimes for from two to three weeks. The eggs of the green apple aphis do not hatch until three or four days after the eggs of the oat aphis.



Courtesy New York Agr. Exp. Sta.
Effects of an attack of apple aphids

All of the species, on becoming full grown, begin to give birth to living young. In the case of the oat aphis, practically all of these young on reaching maturity develop wings and fly to grains, where the insect lives during the entire summer, returning to the apple tree in the late fall and there depositing its eggs. All the species produce several generations during the summer, which are made up entirely of females. The males do not appear until fall, when mating takes place and the eggs are deposited. The rosy aphis remains on the apple tree for two or three generations and then migrates to the narrow leaved plantain, where it spends the remainder of the summer, returning to the apple tree again in the fall. The green aphis is the only one of the three which spends the entire season on the apple.

While the feeding habits of all three species are the same, the effect on the apple is much more severe from a given number of the rosy aphis than from the same number of the other species, and in seasons when this species is abundant, we usually have numbers of knotty apples at picking time. The green aphis, because of the fact that it stays on the tree the entire season, often causes dwarfing and curling of the twigs and is responsible for some dwarfing of the apples. The oat aphis, because of the short period during which it feeds on the apple, is considered by far the least injurious.

As the eggs of the different species cannot be easily identified, it is never safe to predict the numbers of aphis that will occur in a given season from the number of eggs found on the trees during the winter.

Do the Differences in the Habits of the Insects Have Any Effect on the Control?

The fact that the rosy aphis eggs continue to hatch over a longer period than any of the other species has a marked effect on the control.

Why Are There Such Differences in the Abundance of Aphids from Year to Year?

The number of eggs deposited on the apple trees varies greatly from one season to another, this abundance being affected to a great extent by the weather of the fall and other factors which affect these insects during their life on the grains and plantain.

Aphids of all kinds are preyed upon by a number of insect enemies. In springs when the weather is warm, during the period following the hatching of the aphis eggs, and continued warm for two or three weeks, these insect enemies of the aphis are usually able to reproduce in such numbers that they soon check an aphis outbreak. On the other hand, if the weather remains cool, the aphis is able to reproduce at nearly the normal rate, but its insect enemies will scarcely increase at all.

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A New Method of Pruning Black Raspberries

By Stanley Johnston
Michigan Agricultural Experiment Station

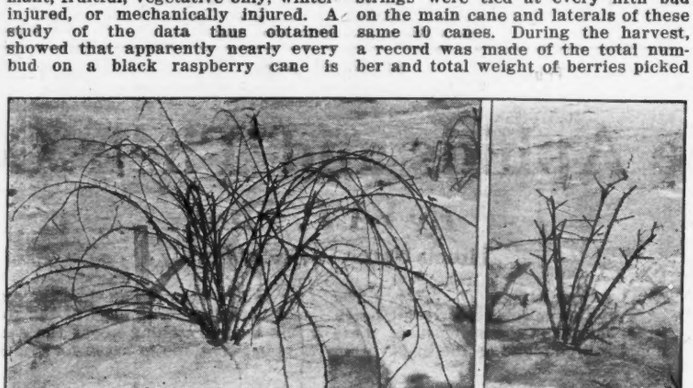
COMPARATIVELY few investigations have been conducted on the fruiting habits and methods of pruning of black raspberries. In fact, the recommendations made for pruning this fruit have been rather diverse and often they have lacked clearness and definiteness. Indefinite terms have been used, such as "medium length," "medium height." In an attempt to obtain more exact information on which to base pruning and other cultural practices, investigations were made by the Department of Horticulture of the Michigan Agricultural Experiment Station. These were conducted at the South Haven Experimental Station, at South Haven, Mich. The detailed results of this investigation are being reported in a bulletin issued by the station. This article presents a summarized statement of the results that were obtained and emphasizes some of the more important lessons to be drawn therefrom.

The Plan of the Experiment

It might be interesting to briefly explain just what was done in the way of actually carrying out this project. Two series of Cumberland plants were selected. In one the plants were thinned to three canes to the hill; in the other, they were thinned to four canes. The pruning treatments in the two series were otherwise identical. Thus, the first group of plants in each series had the laterals or branches pruned back severely, to about four buds. The second group had the laterals pruned to a medium length, while the third group was left with full length laterals, only the winter-injured tips being removed. Realizing that there might be some advantage in reducing the number of laterals, the three groups of plants just mentioned were duplicated, except that the average number of laterals was reduced from five to three.

In order to determine accurately the effect on bud development of these various types of pruning, 10 average canes in each pruning treatment were selected for special observation. A record of the development of every bud was made, whether dormant, fruitful, vegetative only, winter-injured, or mechanically injured. A study of the data thus obtained showed that apparently nearly every bud on a black raspberry cane is fruitful provided it is given an opportunity to make sufficient growth. For example, nearly all the buds on the main cane having the laterals pruned short, responded with a vigorous growth and were fruitful. On the other hand, the buds on the main portion of the cane where the laterals were left medium or full in length made a short growth which usually dried up. This fact has considerable significance in connection with pruning methods. Apparently it is inadvisable to retain certain distal portions of the black raspberry cane in order to avoid a loss of fruit buds. It is rather a question of determining how many buds the cane can carry without being overloaded.

Just before the fruiting season, strings were tied at every fifth bud on the main cane and laterals of these same 10 canes. During the harvest, a record was made of the total number and total weight of berries picked from each five-bud section. This procedure gave a very complete record of what every portion of the cane actually did in the way of fruit production under each of the different methods of pruning.



On the left, a black raspberry plant before pruning. On the right, the same plant after being pruned according to the method described in this article

The Questions of Cane Number and Cane Size

The first step in pruning the black raspberry plant is to determine how many canes to leave. As a result of this investigation, it does not seem wise to designate a definite number. The number of canes should vary according to the vigor of the plant. Real vigorous plants can probably carry six or more canes to advantage, while other plants should have only two or three. However, only reasonably strong, vigorous canes should be left. All weak, spindly canes should be removed. The number of canes for each plant will average about four in most plantations. The size of the cane is of very great importance. The larger the canes were the better were the results from the standpoint of both total yield and size of fruit. Canes 16/32 of an inch in diameter had an average yield of 6.16 ounces, while canes 18/32 of an inch in diameter (at a point six inches above the ground) had an average yield of 8.92 ounces, a difference of 2.76 ounces. On an acreage basis, this would amount to approximately 1000 quarts of fruit. When the size of the cane increased to 21/32 the average yield also increased to 12.47 ounces. With these increases in yield, there was also a slight increase in the average weight of the individual berry.

Heading Back the Laterals

After the proper canes have been selected, the next problem is to determine how long to leave the branches or laterals. It has been a common commercial practice to prune them to a foot or 18 inches in length. However, better results were obtained when the laterals were pruned more severely or to an average of four buds. On an acreage basis the severely pruned plants yielded 202.8 sixteen-quart cases of fruit or a total of 1,754,800 berries, while the plants with laterals medium in length (17 buds) yielded 193.7 cases or a total of 2,256,000 berries. These figures show that the plants with the short laterals yielded 9.1 more cases of fruit on an acreage basis than did the plants with the medium length laterals. Moreover, the fact that this increase in yield was obtained by picking approximately 500,000 fewer berries is

(*Concluded on page* 25)

How About the Japanese Beetle?

By Walter Collins O'Kane
University of New Hampshire

IF YOU could take the common rose chafer or "rose bug," multiply it about 10 times in destructiveness, and then make of it a pest that is steadily increasing every year, both in numbers and in extent of territory covered, you would have a pretty fair parallel to the present situation as concerns the Japanese beetle. It is a serious problem, and the expectation now is that eventually we've all got to reckon with it in our horticulture and agriculture in this country.

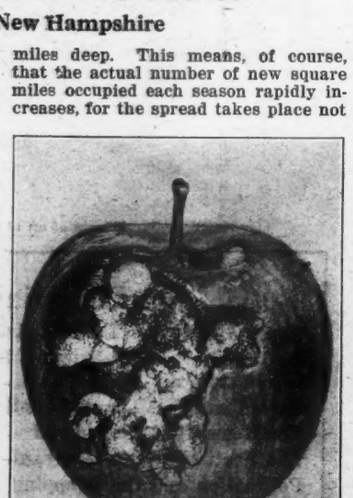
We may as well acknowledge and agree that there is no longer any hope of eliminating this foreign invader. The developments of the last season or two have abundantly proved that extermination is not to be hoped for. If we could have known of this insect right at the beginning when it was first brought into this country, or even within two or three years after that date, it is likely that forces could have been organized to wipe it out. But, like some of its predecessors that have come here from foreign countries to impose their tax on our patience and our pocketbooks, it slipped in and it remained unnoticed for what must have been a considerable period.

There is good reason to believe that it arrived long before our government had set up its present plan for preventing injurious insects from making the jump from other countries to ours. If we had had the present inspection and quarantine regulations in force at that time, the Japanese beetle would not likely have gained entrance.

Large Territory Infested

The territory in which the beetle is now found totals a little more than 2400 square miles and includes parts of the states of New Jersey and Pennsylvania. From the section where it was first discovered in New Jersey, it has spread steadily, extending its range each year by a zone 10 to 15 miles deep. This means, of course, that the actual number of new square miles occupied each season rapidly increases, for the spread takes place not in a single line, but practically in all directions.

That much spread is inevitable. The strictest and most careful regulations are being enforced to prevent the insect making any big jumps through shipment of garden produce, nursery stock and in other similar ways. But the spread by its own natural means cannot be prevented.



Upper left—The adult form of the Japanese beetle, about twice natural size. Lower left—A swarming cluster of Japanese beetles on a peach. Above—Effect of an attack of Japanese beetles on an apple

The adult beetle is a strong flier and is quite capable of travel on its own account. No human agencies can prevent that. Because of that there is no conceivable way in which the pest can be locked up in the territory that it now occupies. The best that we can say about spread is that no stone is going to be left unturned to prevent jumps that could be avoided, and as for the rest, we shall have to accept it, thankful that the present new zone each year is not any wider than it is.

Serious in Territory Infested

Within the territory where it has now been found for a number of seasons, the beetle has become astoundingly numerous. I have visited some parts of that area, and as I drove or walked along, it seemed to me that almost every living plant showed the work of the pest.

As a matter of fact, the list of plants that the beetle is now attacking in this country numbers more than 200 species. This includes many different kinds of weeds, which, of course, we can do without, but which, nevertheless, serve as food to help the beetles thrive along borders of cultivated fields and in other places where the pest might otherwise go hungry. It includes most of our small fruits, most of our tree fruits, many kinds of garden vegetables, several varieties of field crops, many flowering plants and ornamental shrubs, and various species of forest and shade trees.

Among the important plants that are attacked by it are field corn and

(*Continued on page* 47)

The Home That Grew

By Mrs. A. B. Stannard

SEVERAL months ago we offered prizes of $25, $10, and $5 respectively for the three best stories and sets of pictures pertaining to the home life and home conveniences of our readers. The story printed on this page won first prize. Not only is it a good story but the pictures are excellent as well. We hope every subscriber will read this story. It is an interesting account of the problems which one family overcame in developing their fruit farm. No doubt hundreds of our readers could relate similar experiences.

The stories and pictures which won second and third prizes are also presented in this issue. We also offered prizes of $1 each for pictures we could use—it is our plan to publish several pages of these pictures during the coming months.

NINE years ago in September we bought 30 acres of land, located about two miles from Atchison, Kans., just a half mile off the hard road.

We had decided to make a fruit farm and believed that this would be a good place for marketing fruit.

There was not a single improvement whatever, and since we had bought it for a future home, we knew that our improvements would have to be made slowly and gradually, and we decided to live in town until we had gotten the land set out to considerable fruit.

Our First Move

Our first move the following spring was to plant four acres of cherries and peaches, and one acre each of grapes and raspberries, and in between the tree rows we planted strawberries.

The next spring we had some fruit to sell and we set out more trees and more vines. The third year we sold $2100 worth of strawberries from three acres of plants. This made us feel that nothing can bring such quick returns as well cultivated strawberries. We have been growing them for nine years and setting out more ground to them each year, and we have never changed our opinion. One of the best things about them is that the land can be set to whatever you want on it permanently, and while cultivating your berries you are cultivating your trees, and while you are waiting for the trees to produce, the strawberries are paying the way.

Improvements Added Each Year

Each year we did something toward our improvements, building little packing sheds, a barn, and making a well. The third spring we built what we intended for a stable and garage, with a room above for hired help and one for hay. This was a rather neat building, weather boarded on the outside, with good board floors in all four rooms and the walls sealed and windows that opened up and down, and since about this time we were getting ready to harvest a large berry crop, we decided to move into this barn for the summer.

Living in a Barn

We covered the floors with building paper before laying our rugs and I covered the chairs with cheap cretonne and screened the windows with mosquito netting. Although we were lacking in conveniences, this was one of the pleasantest years of our lives. It was enough like camping that we were care free, and yet we were clean and comfortable. Last but not least, we were not paying rent in town, and that brought our real home just that much nearer. We carried our water from the well quite a distance from the house, but this inconvenience was offset by the fact that we had real electric lights. The city lights came to within a quarter mile of the farm and we built our own line to meet it. This cost us $100, and I believe it was the best money we ever spent, because if there is one thing that makes your home pleasant and convenient on the farm, it is good lights. To me having to read by lamp-light would be an unpleasant feature.

We lived in our barn home until all the summer's work with the fruit was over and the weather was too bad to be comfortable. The next year we built a large cistern. This cistern is one of our treasures. It is 15 feet deep and 15 feet square, is cemented and plastered and sealed, and the water runs into it from two large buildings and is filtered through 18 bushels of charcoal. This cistern supplies all the nice, clean, pure, soft water used in the house and for flushing the toilet; we have never been short of water.

Converting the Barn Into a House

The next year we decided that in spite of building conditions we must build our house, so we began to study house plans. We planned and figured and schemed, but never could agree on anything that we could hope to pay for, and we argued and disputed over details until we almost gave up in despair. Finally one day my husband said that he had decided "on his own hook" to take the barn that we had lived in and add to it and finish it up for a house. This we did and we couldn't have a prettier interior if the best architect in the country had planned it. We kept the two downstairs rooms for a dining room and kitchen and built across the front a large living room. The large opening that had been intended for an opening into the garage is filled in with pretty French doors. There is a large fireplace in one end, made entirely, inside and out, of nigger heads gathered up off our own land, which adds interest to the fireplace. Opposite the fireplace are bookcases. Except for these spaces, all the rest of the outside wall space is taken up by windows in pairs, and since the house faces the east, we always have a bright, sunny living room. Nothing can give greater satisfaction than a good living room.

When you see three pretty windows in the south side of the kitchen, you would not think that those three openings were originally intended for the windows for horse stalls, but such is the case.

The Upstairs

The two upstairs rooms make our two bedrooms, and in extending the old roof over the new room it made an eight by 10 room above the living room that makes a fine little den for my husband. Besides these, we built onto the back a small addition for a bath, pantry and small back porch. We put in oak floors on top of the heavy barn floors and ivory woodwork, with mahogany doors and crystal door knobs. With gray tapestry wall papers over the entire house, it is as beautiful and restful a home as you will ever see. It may not be the finest, but things do not need to be the finest to be the prettiest and most livable. The fireplace takes large logs and has the outside ash shift, and when you have known the joy of spending the evening before a cheerful open fireplace with your books and magazines, you can never be happy to sit with your feet on a hot air register.

A Comfortable Kitchen

My kitchen opens off the living room just to the right of the fireplace, and no matter how much time my work keeps me there, I always feel that I am in the family circle. In the summer we have butterfly bushes that grow as high as my three south windows, and the large blossoms peep into the windows and scent the whole room. The view from these windows looks toward a cherry and peach orchard, and tell me anything prettier than fruit trees covered either with blossoms or with ripe fruit.

My happiest hours, truly, are those spent at work in the kitchen. It has the quarter-sawed oak floor, filled, varnished and waxed, exactly like the living room floor, ivory woodwork with the mahogany doors, and ruffled Swiss curtains exactly like every other room in the house. I have never been able to convert myself to the opinion that windows were made to cover up with heavy draperies. Why have a beautiful view, such as it is so easy to have in the country, and then put up several sets of curtains to shut out the view. Give me thin, ruffled Swiss curtains that can be kept spotless with laundering. The walls of the kitchen are white enameled plastering, marked off in squares, to a height of four feet, and the rest of the way up, like the ceiling, they are painted a pretty buff. The room is equipped with a good range, an oil stove, a fireless cooker, an electric table stove, a good kitchen cabinet, a white porcelain enamel table on good noiseless rollers, and two chairs.

The Water System

I might tell here about our water system, which we consider the very best possible for the country. The water from the cistern is piped to a pressure tank in the storm and fruit cellar, which is a few feet from the back door. This pressure tank sends it into the house for the kitchen and bathroom.

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1—"The Home that Grew" after shrubs had been planted and a lawn made. 2—The house before planting shrubs. 3—A view of the young grape vineyard, with cherry orchard in the back ground. 4—The young apple orchard with strawberries planted between. 5—Northwest corner of living room. The French doors open into the dining room (originally the opening into the garage). 6—South end of living room—the fireplace was built from stones found on the place.

American Fruit Grower Magazine
Established 1880.

C. E. DURST, Managing Editor.
Associate Editors:
SAMUEL ADAMS W. A. SCOTT HAZEL BURSELL
MARY LEE ADAMS

Study Your Business

ONE OF our readers wrote us some time ago objecting to our use of such terms as pollination, anthers and stigmas. He took the view that these terms are too technical for the ordinary practical grower.

The magazine is not a technical publication. We aim to use only such terms as we think every good fruit grower should understand. We edit all material carefully and take every precaution to keep the writers within the limits of reason.

It must be borne in mind, however, that fruit growing is a highly developed business. New ideas are being introduced into it every day. New materials and new equipment are constantly coming into use in connection with orcharding. It is only natural that new words should be introduced occasionally.

Let us remember that when we went to school, we learned by meeting new words and ideas daily and mastering them. So it is throughout life. We meet new problems and new obstacles continuously. The most successful persons overcome these problems and obstacles by mastering them and not by avoiding them. The most successful persons are surmounting obstacles throughout their lives, —that is chiefly the way success is attained.

So far as technical words are concerned, we shall always be extremely careful about using them. However, with such a highly developed business as fruit growing, we must use some of them occasionally. Such words as we shall use, every fruit grower should be familiar with. Terms like anther, stigma and pollen are simply tools in the fruit growing business. Any fruit grower who would be successful must know what such words mean and how to use them, the same as he must know the different parts of his spray machine or cultivator.

In this connection we want to call attention to the two diagrams given in connection with the articles by Roberts and Lovell, showing the parts of apple and pear flowers. These are two of the best illustrations we have ever seen on the subject. If you are not thoroughly familiar with all the parts of flowers, we suggest that you learn them at once. Flowers play such an important part in fruit growing, and so much is said and written about them and their development in connection with fruit growing, that we don't see how any grower can succeed best without a knowledge of their parts. A good book on elementary botany should be owned by every grower so that new terms can be learned as they are met.

A Case of Square Dealing

IN THESE days of commercial competition, we see so much unfair dealing that we rather expect more or less of it. It is a matter of satisfaction when we find occasionally an outstanding case of square dealing. An instance of this kind came to our attention recently which deserves recognition.

Two years ago, F. E. Beatty of the R. M. Kellogg Company announced the purchase of the Rockhill strawberry for $50,000. In the purchase he was to get a considerable quantity of plants to supply immediate orders. An extensive advertising campaign, costing $40,000, was conducted. Plants were sold to 6000 customers.

Unfortunately, it developed that most of the plants were untrue to variety. Only about 10 per cent were true Rockhills. This is where the square deal came in. Instead of taking advantage of the disclaimer clause, as so many seedsmen and nurserymen do, Mr. Beatty immediately returned to his customers, without request on their part, $40,000 which he had received for plants. The transaction placed Mr. Beatty in arrears, it is said, to the extent of about $100,000.

The financial loss, as well as other features of the situation, were a sad blow to Mr. Beatty, but like any man with the right stuff in him, he set to work to repair the matter.

Mr. Beatty, by painstaking efforts, sorted the genuine plants from those untrue to the variety, and he has been propagating them under the most careful supervision. The variety has proved equal, he states, to claims made for it, and sufficient plants will be available in a short time to fill orders. He has thus saved the Rockhill out of the wreck.

In addition, Mr. Beatty has had a piece of good luck, which he richly deserves. He has found among the mixture an extra early standard variety which he has named the "Early Bird." Stocks of this also will soon be ready for distribution.

It is not our policy to give free advertising, but Mr. Beatty's handling of this case is so commendable that we feel it our duty to call attention to the matter. He is welcome to whatever benefit this free advertising may give him. If other nurseries and seed firms would follow Mr. Beatty's example in their dealings, it would be a great help to the industry, and we believe it would prove to be good business for them also in the long run.

Patronize Your Government

OUR GOVERNMENT, with all its faults, is the best government on earth. This is sufficient reason in itself why we should patronize it when we can do so.

It was only a few years ago when fruit growers and farmers who wished to borrow money had to pay high rates of interest and high commissions for comparatively short-time loans. When the loans had to be renewed, another big commission had to be paid.

As a result of such conditions, the Federal Land Banks were organized. Under the new system money can be borrowed at five and one-half per cent without paying commissions either at the start or for renewals every few years. The loans extend for 34½ years. For each $1000 borrowed, the borrower pays back $65 a year—this answers for both principal and interest and in 34½ years the obligation is entirely paid off.

Loans must not exceed 50 per cent of the value of the land, plus 20 per cent of the value of permanent improvements. No loan may exceed $25,000, and preference is given to those under $10,000. The money must be used for certain approved purposes, and the borrower must personally supervise the premises. The entire loan can be paid off any time after the first five years.

Fruit growers are sometimes disappointed because they cannot get a large loan for an orchard on the land. It must be remembered, however, that the loans must be absolutely secure; otherwise, the system would break down. An orchard, through lack of care, may deteriorate very rapidly, and thus the loan might prove an insecure one. It is difficult to secure much of a loan on an orchard from any source, unless exorbitant rates are paid, and it is not surprising that the government should be cautious in this matter.

There is another important phase of this question. The Federal Land Banks, in order to raise money to make loans, issue bonds. These draw 4½ to five per cent interest and are tax-free.

If you must borrow money, we advise you to borrow it through a Federal Land Bank, unless you have some particularly good reason for borrowing it elsewhere. If you are fortunate enough to have money to loan, we suggest that you seriously consider Federal Land Bank bonds,—they are a good investment, considering their soundness and their tax exemption privileges.

Child Labor Amendment Fails

THE PROPOSED child labor amendment to the Federal Constitution has failed. More than enough states have voted against it to prevent its ratification. Only three states—Arkansas, California, and Wisconsin—have voted for it.

The proponents of this amendment were apparently drunk with their supposed power. Apparently they believed they exercised sufficient influence to secure the enactment of an amendment carrying the most extreme provisions. Had they been more moderate in their demands the amendment probably could have been passed. We believe that an amendment setting the age limit at 16 years and which exempted from the operations of the amendment the labor of children working on farms without wages for their parents, would have passed without very serious opposition.

225 Thousand

THANKS to the splendid co-operation we have received from various sources, the number of subscribers to the American Fruit Grower Magazine has been increased during the last year from about 200,000 to about 225,000.

This makes a splendid circle of readers. A large proportion of this increase has come in during the last two or three months, following our request for reader co-operation. Many readers sent in subscriptions of their neighbors, and we have received lists of names running into the thousands. Our Circulation Manager has written all these people and has received many subscriptions from them. We appreciate very much this splendid co-operation.

We are well satisfied with the results, but we believe we can still further increase the list of readers in the next few months. Our study of several fruit sections shows that there are still many good fruit growers who are not taking the magazine. Again let us ask that you prevail on your neighbor to send in his subscription or that you send us a list of neighbor fruit growers so that our Circulation Manager can write them. We want only bona fide fruit growers as subscribers, but we want all of these among our readers that we can get.

The Fruit Grower's Dooryard

By Sada V. Blair

EVERYONE knows what the show window does for the merchant. It makes or unmakes him.

Good roads are increasing travel in the country to an extent never known before. Enterprising merchants are quick to adjust themselves to the changing conditions. The new situation with respect to good roads and travel is bringing to fruit growers and farmers both responsibilities and opportunities—responsibilities in adjusting themselves to the new environment and opportunities in the form of roadside marketing, increase in land values, and better living.

A Good Show Window Has Economic Value

The show window or "front" which a farmer or fruit grower presents to the public has an important influence on the attitude of the public toward him and his surroundings. A fly-specked and dusty show window is no more of a detriment to a storekeeper's business than is an untidy and unattractive dooryard to the fruit grower and farmer. What automobilist will gain a good impression of a farm which presents a poor appearance, and what is he likely to think of the owner? Of course, looking at the matter from a purely financial standpoint, we may feel it matters little what he thinks. Especially may this be true if we sell our products in a distant market. But we cannot tell when we may be wishing to sell our farm, and in that case appearances may have a pronounced effect. If we are interested in roadside marketing, as many fruit growers are, appearances will many times decide a sale. We must remember that it is the woman who chiefly makes the purchases and that she is particularly sensitive as to appearances. Whether or not many women will cause their autos to be stopped at your stand will depend on the impression they gain of your establishment as they approach your place on their trips through the country.

The Aesthetic Value Is Important

The economic side, while important, is probably of minor importance compared with the cultural and aesthetic effect of good surroundings on the fruit grower and his family. How does a man and his wife and children feel when their clothes are shabby and run down at the heels? They feel exactly the same way—shabby, run down at the heels, and "down in the mouth." They are pretty likely to take a pessimistic viewpoint toward life. But fix them up with new clothes all around and watch how their backs straighten up and how their spirits brighten and how their nearly dead ambitions are quickened.

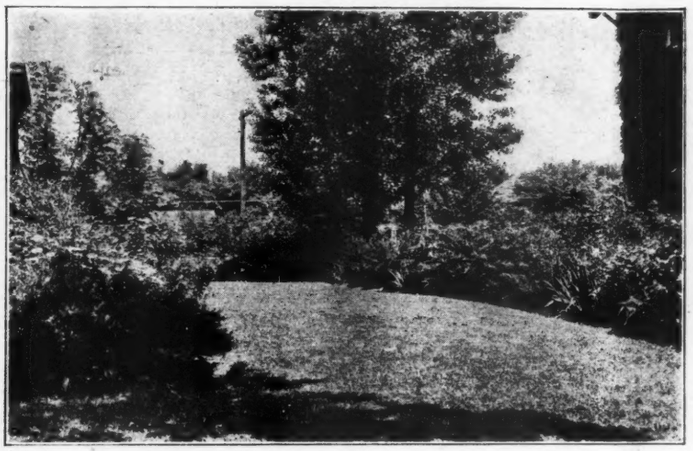
Our surroundings have the same kind of influence. They do uplift, repel, or degrade, and no one can deny it. Children raised amid depressing surroundings are likely throughout life to have their hearts more or less hardened to indifference as they recall the barren and ugly spot once called home. On the other hand, children brought up in an environment flavored by trees, shrubs, flowers, and a green lawn, all part of a well-arranged planting scheme, will have an entirely different viewpoint toward life. And what will be quite important to you as you grow older, the memory of such surroundings will lure your children back to you and their homes time after time in the years to come.

Responsibility, then, both to the family and to your business, demand that your dooryard should represent country life at its best.

Dooryard Decoration Is Inexpensive

If setting one's dooryard in order were an expensive matter, delay, and even neglect, might in many cases seem more or less justifiable, but there is no place where a small amount of money, coupled with good taste, can accomplish as much. Indeed, given good taste alone, and a place to acquire some native material, any sensible person can secure some surprisingly effective results.

It is true, of course, that native material from the woods and river banks, and searching for native plants that is not experienced in selecting things out of a catalogue, even though experience finally teaches us that native material from a nursery is better in



This view, while it may seem somewhat refined for some persons, can easily be duplicated, at little expense, in almost every fruit grower's dooryard by means of a little careful planning and planting

fence corners and roadsides, will not always do as it has been done by. One takes it up with loving care, sets it in a place where it is to be waited upon and shown off with pride, and all too often it displays a warped disposition and an unwillingness to respond to any amount of care and devotion. But there is a certain fascination about going out into the highways the long run than native material from its own habitat.

The First Hundred Years Are the Hardest

In dooryard planting, as elsewhere, the first hundred years are the hardest. That is to say, getting started is the real pull. How does one start?

Judging from some of the neglected dooryards that lie along the highways, the first step in the reclamation process should be the carting out of sight of all rusted and worn-out machinery whose skeletons lie bleaching in the sun. I have seen everything from the pathetic wreck of a baby carriage to the carcass of a defunct spray outfit standing under the very windows of what should have been a home but was only a place to get in out of the rain.

Hide the Unsightly Objects

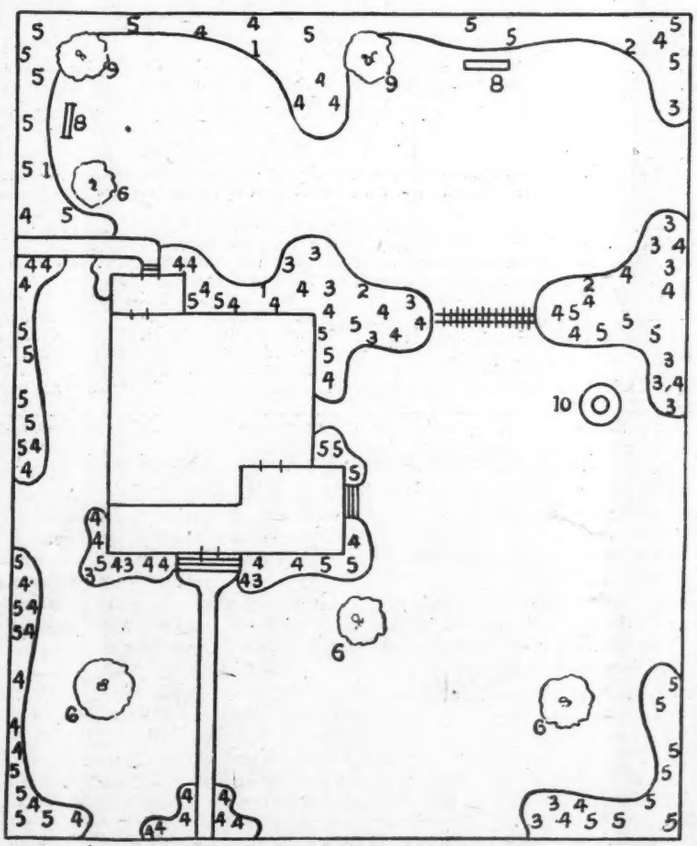
If these relics of past usefulness are not to be parted with, they can at least be hidden behind the barn, and at the same time the location of that barn and the packing sheds had better be considered. There is no reason why they should stand abreast of the house along the highway. Shove them back—way back—behind the houseyard rather than beside it.

If there are misshapen, unsightly trees, remove them. It is little short of criminal to destroy a beautiful tree, but an ugly one has no excuse for cumbering the ground. Let it give place to one that will provide both beauty and shade. Study the neighborhood and learn what trees seem to give best satisfaction as lawn specimens, and then secure the largest and best that can be transplanted. A very few years will bring an elm or maple to a good-sized tree, then why plant box elder and others that have proven themselves a poor investment, for every tree should be looked upon as an investment. It need scarcely be said that the removal and setting of trees cannot be included in Mrs. Fruit Grower's share of the work! She should help in their selection.

Study Your Surroundings

After clearing the yard of all that disfigures rather than adds to its appearance, it should be studied from every angle. Has it a good view of a fine hill or a noble tree (what matter if both hill and tree belong to someone else)? If so, preserve the view at all cost. On the other hand, has the house one side that is more attractive than another? Let that side be open to the highway, and soften with plantings any angularities or uglinesses that cannot be corrected.

Then by shrubs and plenty of vines, tie the house to its surroundings. Someone put it very well when he said that foundation plantings tie man's architecture to God's out-of-doors. He might have added that it also throws a merciful mantle of charity over architectural sins. If you doubt it, drive down the road a short distance and look at that house which only last year stood stark and bare to the four winds with not a sprig of greenery to soften the union of house and earth. Look at it now with quick-growing shrubbery screening the base, and vines clambering over its unsightly walls.



Suggested planting plan for a fruit grower's dooryard. The numbers indicate the position of various materials, as follows: 1—annuals; 2—perennials; 3—dwarf shrubs; 4—medium shrubs; 5—tall shrubs; 6—shade trees; 7—arbor or archway; 8—garden seat; 9—specimen plant; and 10—bird bath. Note that the larger plant materials are placed in the rear and the smaller ones in front. The numbers pertain to position as to height of plant materials and have no reference to the number of specimens required

Do Not Overdo the Planting

But when the planting bee gets under the family bonnet, do not get excited and overdo the business. It is all very well to make two apples grow where only one grew before, but don't try to put two flower beds where there is really no excuse for any, and don't, above all things, scatter shrubs about promiscuously. A flower bed is an unsightly thing except during the growing season, so it has become a pretty custom to avoid the barren ugliness of empty beds by putting the flowers along the border, or if one just must have some beds, let them be placed at the rear, where their desolation will not be in evidence during the winter. Keep the front lawn a real lawn of smoothly trimmed turf rather than a medley of small plantings.

Group Your Plantings in Borders

Of course, there are some shrubs so beautiful and graceful that it is entirely fitting to give them plenty of room so as to allow each specimen to

(*Continued on page 20*)

Pollination and the Dropping of Apples

By R. H. Roberts
University of Wisconsin

THE FAILURE of apple blossoms to set fruit and the dropping of many fruits while yet small are generally explained as due to lack of proper pollination. Is this viewpoint, which seems to be largely based upon assumption, justified by the facts in the case? Is inadequate pollination the only cause of such results? It appears that other factors are sometimes equally responsible.

By pollination is meant the transfer of pollen from the anthers to the stigma or receptive region of the pistil. This process is generally performed accidentally by honey and wild bees when they visit the blossoms to secure nectar or pollen. After pollination the pollen grains germinate to form a pollen tube which may grow through the style into the seed cavity and into the ovule (Figure 1). It is by passing through this tube that the male cell of the pollen grain reaches the female cell of the ovule and fertilization is possible.

Pollination Is Necessary to Fruit Setting

No cases are known in which apple seeds have developed without fertilization, although fruits may occasionally develop without seeds. This last condition is so rare as to be of no practical importance at present, although a commercial seedless variety may some day be found. Attention naturally centers upon pollination because of its critical position in the sequence of events which result in a mature fruit. Practically it can be said that if no pollen is transferred, no tube develops, no cells unite, no seed forms, and no apple matures. Likewise, if no good, or so-called compatible pollen, is transferred the blossoms also drop. It is this last item that gives the apple pollination question its principal significance. Most commercial varieties of apples are self-sterile; that is, pollen of a certain variety will not fertilize the blossoms of the same variety. The grains germinate, but the tubes do not grow far enough to reach the ovule. Some varieties are listed as self-fertile in some localities, but it seems that almost no kinds are self-fertile in all localities. For example, Wealthy and Grimes have been found to be self-fertile in some places but self-sterile in others.

The necessity for planting two varieties together and of having bees or other suitable insects to carry the pollen between varieties has resulted in pollination being greatly emphasized in orchard experimentation as well as in orchard practice. In fact, the impression is very general that "the fruit will set if it is cross-pollinated." A logical result of this viewpoint is to explain all cases of the dropping of the fruit as due to the lack of proper pollination.

Pollination Does Not Insure Fruit Setting

Let us see what conditions actually exist in small orchards of mixed varieties which are well pollinated. Do all blossoms set fruit under such conditions? The answer is certainly no, for it is found that large numbers of the blossoms and fruits drop even under these conditions.

For the purpose of studying the drop question, the blossoms and fruits which fall may be grouped into three classes: first, the blossoms which drop almost with the petals; second, the small fruits which fall a little after the calyx closes; and third, the larger fruits, which drop later, usually referred to as the June drop. Examination of the first class shows that pollination took place but that fertilization did not occur because the ovules were abortive. In the second and third classes, fertilization had occurred and seeds had started to develop. It is generally believed that fruits which fall do so because they do not have good seeds. This belief is based upon examinations of the fruits after dropping when the seeds have had time to shrivel up. Earlier examination shows that the fruits contain seeds, thus proving that fertilization took place. Pollination, although necessary as one of the steps in fruit setting, does not in itself insure fruit setting.

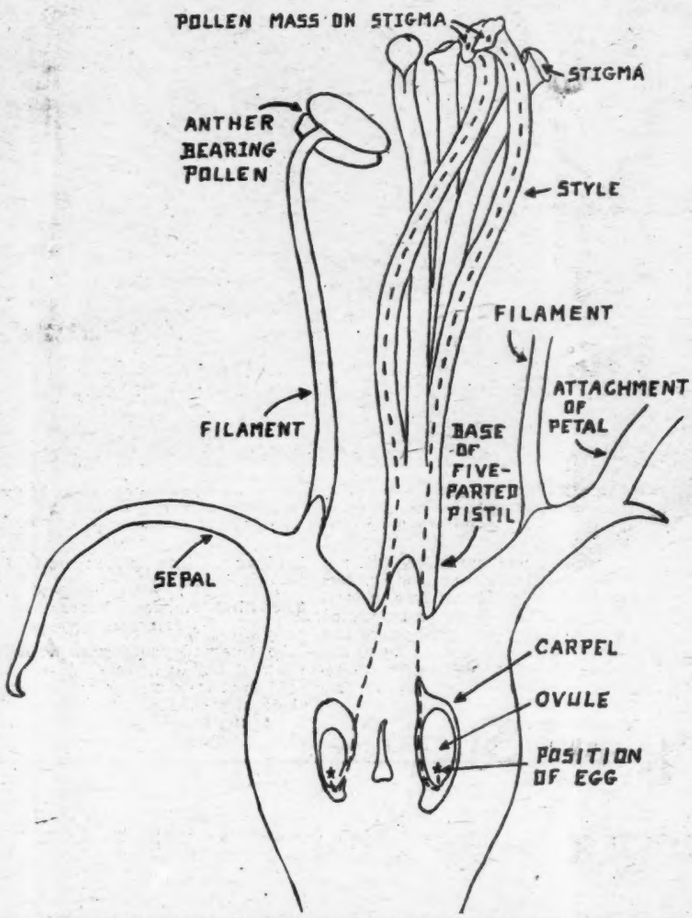


Figure 1—A diagram showing the different parts of a flower. Every fruit grower should know the names of the different parts and their functions

Fruit Setting Is Affected by the Amount of Blossoming and by Growth Conditions

It is well known that the best set of fruit occurs on trees which have a light blossom. One of the most constant items of apple tree performance is the inverse relation of the number of blossoms to the percentage of set; that is, with heavy blossoming only a small percentage sets. In fact, it is quite common to see trees of some varieties with a snow-ball blossom shed so many blossoms that the crop of fruit is slight.

What, then, are the conditions other than good pollination which are necessary to fruit setting? With the average fruiting tree the best set of fruit is in the top of the tree. Furthermore, the terminal blossoms set better than those borne from weaker spurs and the lateral buds. It seems that this is no accident but rather that there is a relationship between the growth made by the blossoming spur and the setting of the fruit. The setting of the fruit seems to be very closely related to the growth of the secondary shoot of the spur (see Figure 2). If there is little or no secondary growth as occurred in the two spurs on the left, it is unusual for the fruit to set, even when properly pollinated. If there is a strong secondary growth, as took place in the spur shown on the right, a fruit usually sets if pollinated. Another way of describing this same condition is by the common saying that the set of fruit is related to the foliage present. The point seems to be this: The fruit is a vegetative structure and as such its fate seems to be largely bound up in the general vegetative condition of the spur; if growth is finished early and new shoot and leaf development stops by blossom time, the fruits stop growing and drop off; if spur growth continues on through the blossoming and fruit setting period, the fruit continues to grow and sets. Recent observations indicate that the usually observed injurious effect of "poor weather at blossoming time" has its influence through producing poor growth conditions rather than through interfering directly with pollination. However that is, the main point at hand is that a strong vegetative growth seems to be essential for a good set of fruit in many varieties. The set is also different for different parts of the same tree (see Figure 3). A good early season growth seems as necessary as pollination in getting the fruit to set well.

Figure 2—On the left are shown two apple spurs which made no secondary growth and which set no fruit. On the right is shown a spur which made a good secondary growth and which set fruit

If the trees blossom and do not set fruit, it may be due to lack of pollination, but it may also be due to improper nutritional conditions. The providing of pollen (that is, of other compatible varieties) and pollen carriers solves the first difficulty. The second type of trouble requires other treatments.

Early Spring Fertilizer Applications May Help the Set

The use of early spring applications of readily available nitrogen fertilizer may greatly increase the set of fruit on some varieties. With varieties which may have heavy early drops, as Winesap or McIntosh, even this method is too late to have much effect. Some other means must be taken to secure a sufficiently strong early season growth to provide the conditions which seem to be necessary to get the fruit to set. It seems that the kind of reserves in the tree are a principal factor in early season growth and fruit setting; that is, the previous season's treatment is probably of as much importance as are the spring cultural operations. From this standpoint fall conditions, such as the nitrogen content of the soil, may sometimes show pronounced effects upon fruit setting in the next spring.

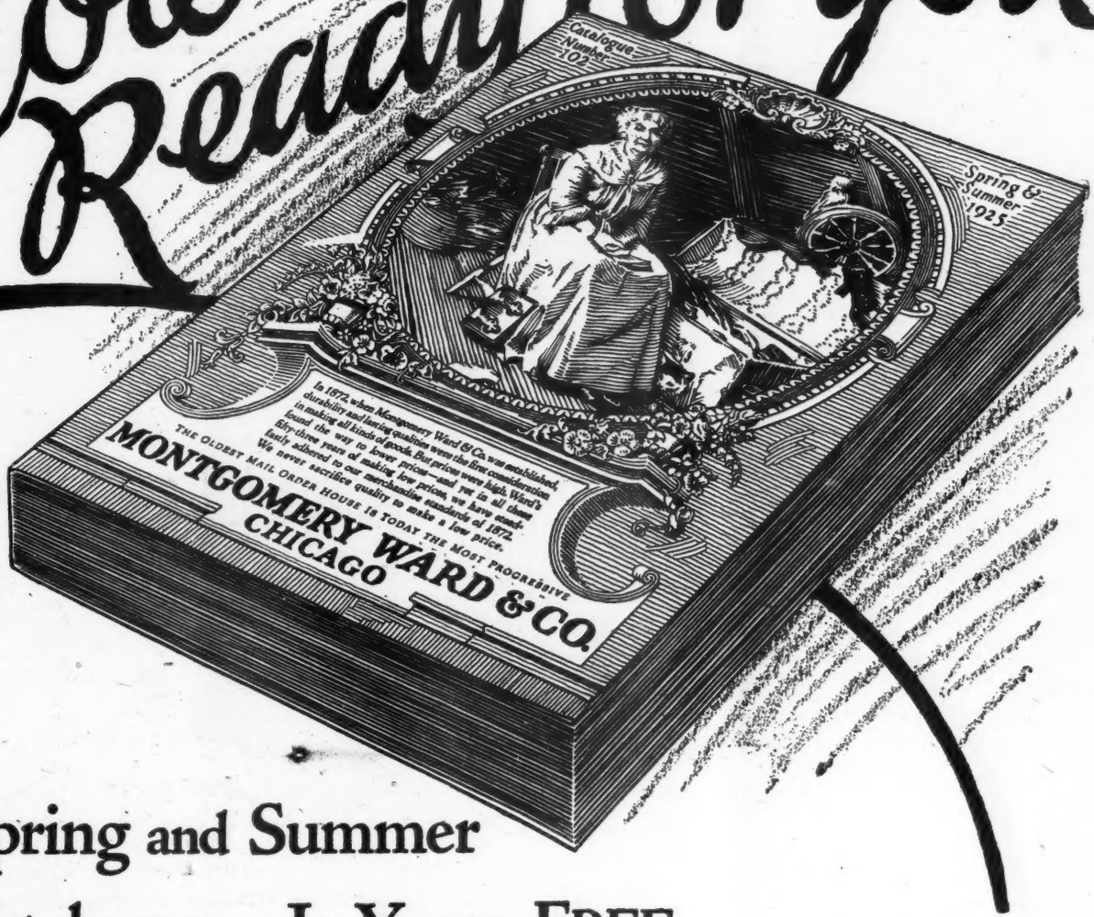
Pruning of a type to remove the weaker, less vegetative wood and thus direct the energy of the tree into a smaller number of the more vegetative growths has given striking results with McIntosh. The aim and result is to secure a tree which has only the type of growth which sets fruit well, as illustrated by the tree tops and stronger spur growths and terminals.

If the entire tree is making little growth the need is for increased fertility. If the tops and main terminals are making a satisfactory growth but there is much weak, "run out" wood about the tree, then pruning should be practiced to secure uniformly strong-growing and good fruit-producing wood throughout the tree.

Do not blame the dropping of the fruit to pollination if the trouble is due to weak or poor vegetative wood which makes a poor early spring growth. If the blossoms drop because they are not being pollinated, provide good pollen and bees to carry it. If the blossoms drop because the tree is too

(*Concluded on page 45*)

Now Ready for you



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The Pollination of the Pear

By John H. Lovell

ABOUT 1874 the Old Dominion Fruit Company planted at Chestnut Farm, near Scotland, on the James River, Va., an orchard of 22,000 standard Bartlett pear trees. When the trees were 12 years old, although they bloomed profusely and were snow-white with flowers, they yielded at the rate of only three-fifths of a peck per tree, whereas they should easily have produced four or five times that quantity. In 1891 the crop was only 1200 boxes, and in 1892 it was less than 100 boxes of three pecks each. Clearly, something was wrong.

In three places in the orchard where the trees had died, two Clapp's Favorite and a Buffum had been planted by mistake; and in their vicinity the Bartletts fruited heavily. A small orchard containing a variety of trees was very productive, and Bartletts near this orchard also bore well. Here was the clue that was too plain to pass by.

Waite Discovered the Cause

The assistance of M. B. Waite of the Department of Agriculture was sought. Waite solved the problem in the following way: He removed the stamens from a considerable number of unopened Bartlett flower-buds and pollinated a part of them with pollen from other varieties of pear trees and part of them with Bartlett pollen. All of the hand-pollinated flowers were enclosed in paper bags, which were not removed until the petals had fallen. Within a week after the fall of the petals, the young pears all over the orchard dropped off, never starting to grow. Most of the trees were wholly barren, but in a few cases there were two or three pears to a tree. Of the flowers hand-pollinated and enclosed in bags, not one pollinated with Bartlett pollen produced fruit, but a large proportion of those cross-pollinated with pollen from other varieties of pear trees set fruit. It was clearly evident that the Bartlett was largely self-sterile and that in order to obtain a satisfactory crop cross-pollination with another variety of pear was necessary. In discovering that the productiveness of fruit trees is largely dependent on cross-pollination, Waite opened up a new and important field in scientific and practical horticulture.

Investigations Continued

In 1892, at Rochester and Geneva, N. Y., Waite continued his experiments on the self-sterility of pears. Careful hand-pollinations of a great variety of pear flowers under the protection of paper bags were made and the results of cross-pollination and self-pollination carefully recorded. The following varieties of pears were found to be largely self-sterile: Anjou, Bartlett, Boussouk, Clairgeau, Clapp's Favorite, Columbia, De la Chene, Doyenne, Sieulle, Easter, Gansels, Bergamotte, Gray Doyenne, Howell, Jones, Lawrence, Louise Bonne de Jersey, Mount Vernon, Pound, Sheldon, Souvenir du Congress, Superfin, Wilder, and Winter Nelis. The varieties which were largely self-fertile were: Angouleme, Bosc, Buffum, Diel, Heathcote, Doyenne d'Alencon, Flemish Beauty, Le Conte, Manning's Elisabeth, Seckel, Tyson, and White Doyenne.

Most varieties of pear trees are largely or partly self-sterile, i. e., they remain barren unless pollinated with pollen from a different variety of pear. Even the self-fertile varieties in the long run appear to yield more and better fruit when cross pollinated. But a variety may be largely self-sterile in one locality and largely self-fertile in another. No sharp dividing line can be drawn between them. The Bartlett pear is almost entirely self-sterile in the eastern states, but in the Interior valley and along the coast of California it is nearly self-fertile. In the eastern and southern states many pear orchards have proved unsatisfactory for want of cross-pollination. Even in California, the Bartlett is largely self-sterile in the Sierra Nevada foothills, and many other varieties of pears are self-sterile under valley conditions.

Bartlett Is Leading Variety

Previous to 1880 and the introduction of the hybrids of the oriental or sand pears, especially the Kieffer, it was estimated that 90 per cent of the pear trees under cultivation were Bartletts. A few years ago, the late John Craig stated that the Kieffer now outnumbered every other variety in this country. As 90 per cent or more of the pears grown for market today are Bartletts and Kieffers, it is most desirable to determine how far they are self-sterile and what varieties will pollinate them satisfactorily.

Fletcher's Experiments.

A large number of experiments have been made by S. W. Fletcher for the purpose of discovering the best pollinators for each of these varieties. Obviously a very large number of pollinations is desirable, and his conclusions were based on 8275 pollinations of Kieffer, and 9867 pollinations of Bartlett. (*Continued on page 16*)

1—Diagram of pear flower, showing the different parts, much enlarged. Sp. sepal; p, petal; f, filament; a, anther; st, style; s, stigma; ov, ovule; and d, disc. 2—Pear flowers about two-thirds natural size

Recent Rootstock Developments

By M. J. Heppner

University of California

IN THE March, 1924, issue of the American Fruit Grower Magazine, the writer presented figures showing the percentages of various rootstocks used for the different deciduous fruits by California nurserymen during the years 1919-1922. As is shown by the table, some marked changes occurred in the demand for certain rootstocks for many of the fruits between the years mentioned. These changes were brought about by several agencies, all of which were mentioned in the article. The reader will recall that the writer predicted some even greater changes would occur during the year 1923. In order to ascertain whether this was true, the nurserymen of the state were canvassed during the early part of 1924 in a manner similar to that done in previous years. The figures secured are given in the table, together with the figures for 1919 and 1922.

It will be noted that little change has occurred in the percentage demand for the cherry stocks. During the last year, one nursery reported sweet cherry on the Morello root. At the present time this relatively new rootstock for California sweet cherries is receiving a great deal of attention from both nurserymen and growers. Many Italian nurserymen stand by this as the best stock for the sweet cherry. Bearing trees on this root in the vicinity of Stockton, Calif., are giving splendid results. The root is capable of withstanding heavy and wet soils; trees budded on it make smaller trees than those on Mazzard and Mahaleb; the trees come into bearing early and splendid crops are produced. It appears as though the Morello cherry will soon take its place as an important rootstock in California for sweet cherries. However, before this can be determined, the stock will have to undergo a thorough test in different sections of the state under various soil and moisture conditions.

PERCENTAGES OF ROOTSTOCKS OF DIFFERENT KINDS USED FOR VARIOUS FRUITS IN CALIFORNIA IN 1924

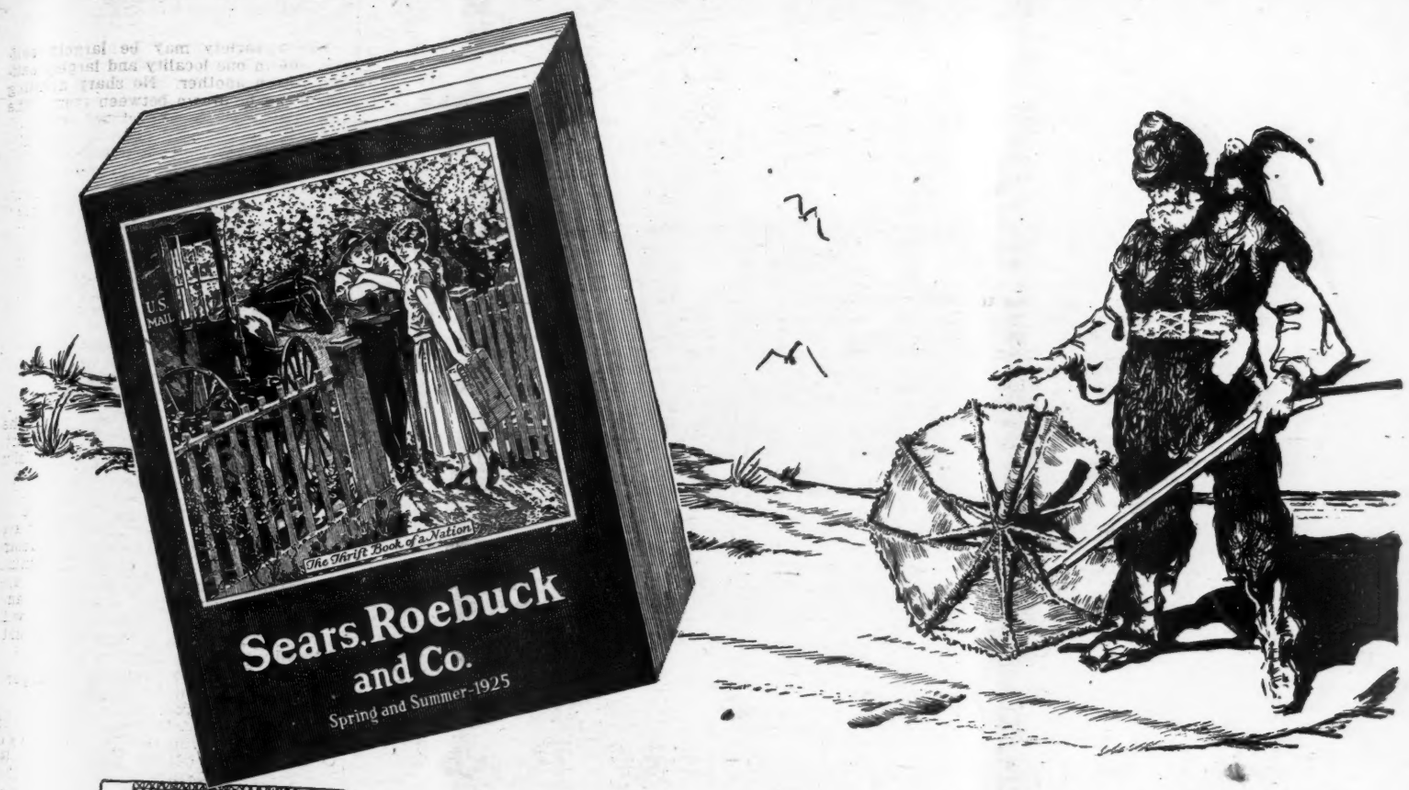
Variety.	Percentage of Different Rootstocks. 1919.	1922.	1923.
CHERRY—			
Mazzard	78.8	80.4	80.3
Mahaleb	21.2	19.6	19.1
Morello	...	...	.6
ALMOND—			
Almond	67.3	72.0	35.9
Peach	32.7	28.0	64.1
APRICOT—			
Apricot	49.1	46.8	32.0
Myrobalan	23.7	22.5	13.8
Peach	27.2	30.7	52.3
Davidiana	...	...	1.3
PLUM—			
Myrobalan	62.4	57.6	42.4
Peach	31.6	29.6	49.8
Apricot	4.4	10.7	7.6
Almond	1.6	2.1	.2
PRUNE—			
Myrobalan	63.3	63.8	54.5
Peach	21.2	25.2	38.2
Apricot	5.1	1.4	2.9
Almond	10.4	9.6	3.0
Davidiana	...	...	1.4
PEACH—			
Peach	98.3	98.0	98.96
Almond	1.3	.3	.28
Apricot	.4	1.4	.20
Myrobalan	...	.3	....
Davidiana	...	...	.56
PEAR—			
Japanese	63.0	68.0	42.5
French	33.0	23.4	34.4
Quince	4.0	6.2	9.9
Calleryana	...	2.4	....
Old Home on French	...	...	9.2
Old Home on Ussuriensis	...	...	1.4
Ussuriensis	...	...	2.6

Mahaleb Roots Gaining in Popularity

Although the demand for the Mahaleb root is far from equalling that for the Mazzard, the writer is of the firm belief that this condition will not exist for any great period of time. Most nurserymen claim that the demand for the Mazzard root is greater than for the Mahaleb chiefly due to tradition. Cases have been recently called to the writer's attention where the Mahaleb is giving far better results than the Mazzard under the same soil and cultural conditions. There is no doubt but that the Mahaleb root has its place in California as a sweet cherry rootstock. Most growers claim that this root dwarfs the tree, and also that a bad constriction develops at the point of union between the stock and scion. However, recent developments in methods of budding have shown that this dwarfing tendency can be obviated.

Marked Change Taking Place in Almond Roots

During the past few years a marked change has occurred in the percentage of stocks used for the almond. In 1922 there was a greater demand for the almond root. In 1923 this condition was reversed and we find a greater demand for the peach as the stock for the almond. Why such a com- (*Concluded on page 50*)



What Robinson Crusoe Needed

Robinson Crusoe, stranded on his desert island, could have had the world at his service if he had found a Sears-Roebuck catalog. For it would have brought him all the things he needed to make life worth while.

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A Cheap and Easy Way to Make Bordeaux Mixture

By W. P. Duruz
University of California

THE MAKING of Bordeaux mixture at home has always been a more or less expensive and time-consuming task. The standard directions call for a platform and special vats or barrels erected thereon for mixing the Bordeaux, after which it is run into the spray tank. Lacking the above mentioned equipment, the grower is obliged to use two men for pouring the two diluted stock solutions simultaneously in a *single stream* into the spray tank.

As a matter of fact, the above described method is little used in practice, though it may be theoretically correct. Men have found that this method requires too much time and is unhandy, to say the least. The platform idea is not in general one that fruit growers will follow, and rarely can one find two men using the single stream process.

A method which has been found more satisfactory and which is quicker and cheaper is as follows:

1. Prepare the stock solutions by dissolving the bluestone in water at the rate of one pound to one gallon. Slake the lime thoroughly and then dilute with water to make the milk of lime equivalent to one pound to one gallon. Keep these stock solutions separate until ready for spraying.

2. Place the screen over the filling hole of the spray tank. Fill the tank three-quarters full with water. Add the bluestone stock solution in the proper amount to give the desired strength, that is 7-8-50, 5-5-50, etc. Start the engine in order to thoroughly mix the solution. Keep the engine running during the entire process.

3. Stir the milk of lime thoroughly. Then pour it into the spray tank, using a paddle to break any lumps that form on the screen.

4. Wash through all of the residue with water, and fill the tank.

Two men can easily and quickly do this job and have enough time to service the engine, etc. Anyone who has done spraying knows that there is a certain amount of time consumed in waiting for the tank to fill and this can be profitably utilized by the use of this method.

The manipulation of this method has been worked out in various ways. Some growers who have enough barrels prepare stock solutions a week or two in advance of the spraying season. Other growers who have a limited number of barrels mix a batch each time the spray rig comes in and use this for the next tank load.

It is sometimes stated that this procedure results in a somewhat less satisfactory mixture. Even admitting this to be true, the advantages are such that they outweigh any slight theoretical discrepancies. As a matter of fact, however, the method herein suggested gives a *better* mixture than the one usually recommended because the milk of lime is broken up into fine particles as it goes through the screen. These particles come in contact with the whirling mixture of bluestone, and are at once precipitated and thoroughly mixed. On account of the fact that the agitator is running, a much better mixture is secured than by hand mixing in vats on the platform or by the single stream method.

One fruit grower has stated that he estimates a saving of $3000 per year as a result of this idea. He said that the platform method consumed so much time that he ceased making his own Bordeaux and bought the commercial powdered form. These commercial preparations cost from $4.80 to $6 for 200 gallons of spray. The materials required for home-made Bordeaux amount to $2.05. There is, therefore, a saving of at least $2 a tank in favor of the home mixing. Fruit growers with large plantings therefore are able to save considerable money by making their own Bordeaux.

Salesmen of commercial spray companies emphasize the *time* saved by using commercial preparations. Everyone knows that there is a certain amount of time consumed in filling the tank with water, regardless of the kind of material used. Instead of the men standing around waiting for the tank to fill, they may use their time to better advantage in preparing stock solutions and mixing up another batch of material.

Pruning Pecan Trees May Prevent Disease

PRUNING is an effective means of controlling diseases of the pecan tree, according to Dr. O. F. Burger, plant pathologist of the Florida Experiment Station.

Pruning should be done before the leaves fall, or as soon thereafter as possible. This enables the grower to detect dead or diseased twigs and branches which might be easily overlooked after all leaves have fallen from the trees.

Dead or diseased parts of the pecan tree should be pruned well back into the healthy wood. Where large branches are cut off, the wounds should be painted with some substance, such as Bordeaux paste, grafting wax, carbolineum or paint, which will prevent evaporation and reinfection.

In pruning, cuts should be made close to the main branches so that no stubs will be left. Stubs usually die back and offer opportunity for reinfection, and provide easy places for the fungi to harbor and live. All pruned parts should be burned immediately to destroy fungi and insects clinging to the wood.

Piling and burning the leaves that fall from the pecan tree is advocated by many growers, in that it kills the spores of disease that may be troubling the tree and its fruit. However, this destroys much valuable humus that the soil needs. Unless the trees are known to be very seriously infected by disease, it is believed that satisfactory results will be secured by simply plowing the leaves under in the fall of the year. The plowing should be as deep as possible without cutting many roots.

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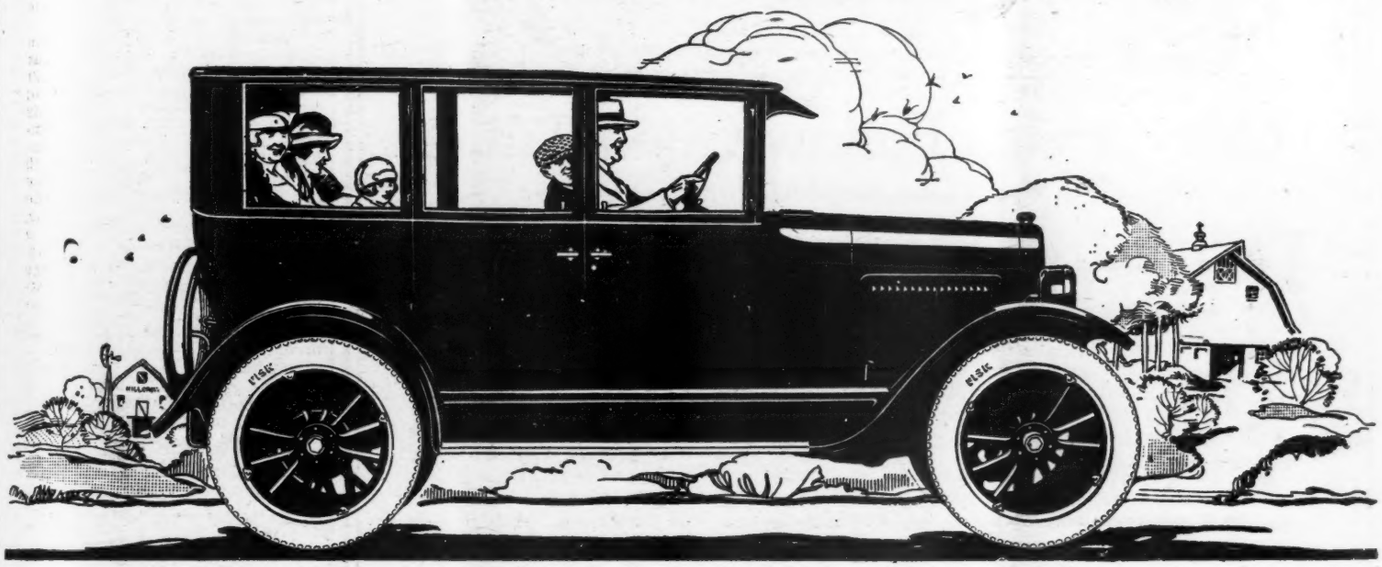

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A New Wrinkle in Spraying

By A. B. Bryan
Clemson College

APPLE orchardists in the mountains of northern Georgia, where a big apple industry is developing rapidly, are showing great interest in a gravity spraying system recently installed in one big orchard that will mean an enormous reduction in the heaviest of apple orchard expenses, namely, the cost of applying five or six sprays yearly.

The new system has been worked out by H. M. Waldrop, superintendent of the Habersham Orchard and Improvement Company, of Clarksville, Ga., at the foothills of the Blue Ridge mountains, where, because of the topography of the land and the distance to be covered, the spraying problem has always been a difficult one.

Mr. Waldrop first worked out a water supply providing a down-hill haul of spray for the main orchard tract containing half of the company's 30,000 trees, by piping water from a mountain spring to the highest point on the tract, building a 1500-gallon tank at that point, and putting filling stations at important points in the orchard. During the past season this system worked well and reduced greatly the time required in spraying the 15,000 trees in the company's main tract.

Further work on the problem by Mr. Waldrop resulted in a spraying system which is most simple and which will enable him to spray 15,000 trees in five days with six men, whereas under the usual system the same job requires five spray machines, 15 men, 10 mules and 10 days. And, what is more, the complete equipment for the new system cost less than $2500—including the pumping station—which is less than the cost of five spray machines needed under the old plan.

The Waldrop system is described and explained as follows: The center of the Waldrop plan is the water tank on the hill, already used for the water supply. Here is installed the spray cooking outfit and a boiler, engine and pump. From this pumping station run two main pipe lines, arranged so as to center the two main sections of the block of trees. One of these is of one and one-half-inch pipe and the other of one-inch pipe. Every 360 feet along these lines extend out transverse lines of half-inch pipe, running at right angles. From the end of the larger line, a one-inch pipe line will run up a long, narrow neck of the orchard.

At intervals of 360 feet, or 12 tree rows, along all of these lines there are hose connections, and the pipes are so arranged that no tree is more than 200 feet from one of these connections, except in one or two small areas where it seemed best to use more hose rather than more pipe.

With a 200-foot section of spray hose and a double nozzle, a man sets out to spray an area, connecting his hose with the upright pipe placed there for the purpose, and sprays 144 trees before making another connection. A special method of spraying up one side of a row and down the other and working out at certain places reduces the dragging of hose. On the main and subsidiary lines valves are placed so that the flow of the spray solution can be controlled and confined to the section of pipe in use. In this way the corroding of the pipes by the solution can be avoided, for when the spraying on a section of pipe is completed, a signal is given the pump operator, who transfers his intake from the solution to a tank of clear water, the spraying crew opens the furthest outlet, and the pipe is thoroughly washed before going to another section.

Every line of pipe runs down-hill, and thus gravity aids the pump throughout the block. This greatly reduces the load on the pump; and, in fact, if a breakdown should occur, gravity alone will furnish the necessary pressure for spraying, as shown by a test made by Mr. Waldrop while planning the installation. He connected a hose to a pipe running down from a spring to his house, where the fall is much less than that in the orchard, and found ample pressure to spray thoroughly in a half-minute a nearby tree considerably larger than the average apple tree.

One expert nozzleman, Mr. Waldrop says, can spray 500 trees a day under the new system, or six men can spray 15,000 trees in five days. On the other hand, one spray machine, drawn by two mules and manned with a driver and two sprayers, is needed for each 3000 trees, the rate being about 300 trees per day. Hence, it would require five machines, 15 men, and 10 mules 10 days to do the same 15,000-tree job. And this does not take into consideration the difference in wear and tear, the feed of the mules, and the problem of hauling a heavy tank of spray around on soft ground.

If the installation in the first block works as well as it promises, Mr. Waldrop expects to extend the system over the entire area of the company's orchards. He will pipe each of the other four blocks of trees from the highest point in that block. Then when he wishes to spray, he will take a large spray machine, connect it to the center of each pipe system in turn, and spray the block through the pipe instead of hauling the heavy machine about over the block.

Eat More Apples

"DO YOU long, young lady, for tinted cheeks and healthy rosy lips—now known hoarding pictorially as 'that school-girl complexion?' If so, eat apples twice a day, every day, as long as they are available, and that is all through the year. Do not look at your peach-bloom-faced neighbor and long for a clear complexion. Just keep your 'Dorothy' or hand-bag, attache case, or even pocket, well bulging with apples; it will be as good as gold to you, and will certainly improve your looks, if anything will.

"Are your organs lazy, men of sedentary habits? Must they be governed and controlled and run by the medicine chest? Eat apples, raw and cooked, and drink cider. Any way and every way, and very soon the kidneys, liver, stomach, indeed, almost the entire system will respond gradually to the influence of this God-given fruit, and health will be yours merely for the simple effort of 'eating thereof.' The acids of the apple help to eliminate from the body noxious matters which, if retained, make the brain heavy and dull, and impart that liverish feeling which is neither good for the liver nor those round about.

"A good, ripe, raw apple is one of the easiest of vegetable substances for the stomach to deal with, the whole process of its digestion being completed in 85 minutes. You cannot eat raw apples? Well, then, eat them baked, for they do not lose any of their value through cooking, and there are almost as many ways of serving up apples as there are days in the year."—*The Fruit Grower (England).*

The Pollination of the Pear

(*Continued from page* 10)

The averages showed that when Bartlett was crossed with its own pollen one flower in 513 set fruit; but when Bartlett was crossed with Kieffer one flower in 10 fruited; when crossed with Anjou one flower in seven fruited; and when crossed with Lawrence or Dutchess, one flower in 10 set fruit. The average weight of

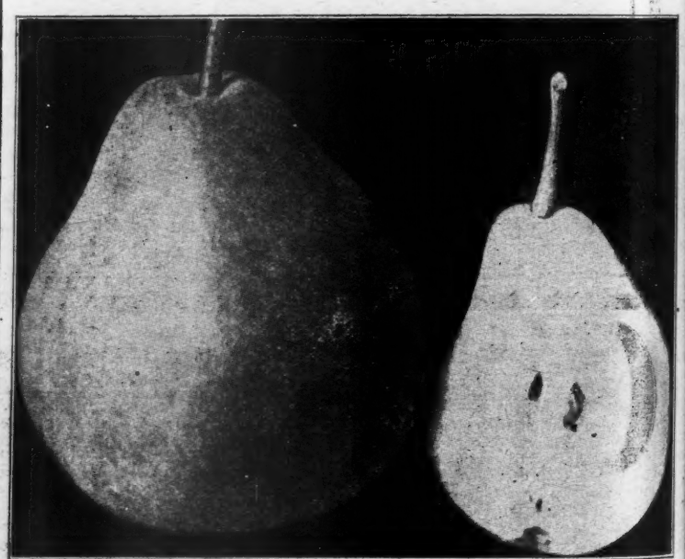
Diagram showing the distribution of pear production in the United States

Bartlett pears when crossed with Bartlett pollen was two ounces; when crossed with Anjou three and three-quarters ounces; and three ounces or more when crossed with the other varieties. When entire trees were covered with sheeting or mosquito netting they produced very few pears; but branches permitted to protrude beyond the covering and cross-pollinated by insects were loaded with fruit, weighing on an average three ounces each.

Experiments with the Kieffer pear showed that it likewise was largely self-sterile. Out of 1268 flowers of Kieffer pollinated with its own pollen only one flower in 253 set fruit; out of 2363 flowers of Kieffer pollinated with Bartlett pollen 446 flowers set fruit; and out of 2764 flowers of Kieffer pollinated with Dutchess 564 flowers fruited. When Kieffer was pollinated by Le Conte, Lawrence, Anjou, Clairgeau, and Garber it was also very productive. While the above experiments were made in West Virginia and Michigan, the results probably apply to all parts of the East.

California Experiments

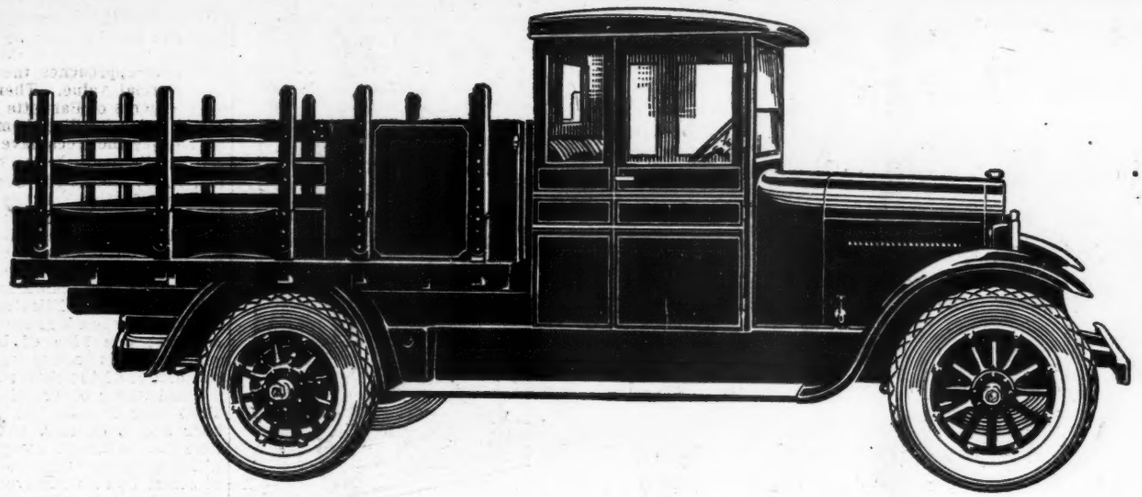
Let us now turn our attention to a far-distant state, where conditions are widely different from those of the East. In 1919 W. P. Tufts published a bulletin on the pollination of the Bartlett pear in California, and in 1923 a later report. In California no other pear approaches the Bartlett in commercial value. There are thousands of acres of Bartletts with no other variety to fertilize them. In the Interior valley the trees have been remarkably fertile and have yielded profitable crops. It has been assumed that other varieties and honey bees were not needed. But Tufts has shown that in the Sierra Nevada foothills the Bartlett is almost self-sterile, and that to a limited extent it is also self-sterile in the Interior valley and along the coast. In the Interior valley solidly planted Bartlett orchards in years of heavy bloom may set two or three per cent of self-pollinated flowers and give a satisfactory yield. But in the long run there are likely to be many years of light crops if only one variety is planted. In 1916, 1917, 1920, 1922, and 1923 at the University Farm (Interior valley) cross-pollinated Bartletts gave much larger crops than self-pollinated trees. Winter Nelis always gave the highest set, but Comice, Bosc, Easter and Hardy also gave satisfactory results. Howell, Angouleme, Anjou, and Forelle were fairly good pollinators.



Comparative size of cross and self-pollinated Kieffer pears

Of the other varieties of pears grown in the Interior valley the following were self-sterile: Alencon, Bloodgood, B. S. Fox, Comet, Forelle, Le Conte, Madeline, and Winter Nelis. The following were self-fertile: Comice, Flemish Beauty, Hardy, and Howell. There are 13 varieties which did not behave consistently from year to year and are, therefore, classed as

(*Concluded on page* 18)



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The Pollination of the Pear

(*Continued from page 16*)

doubtful, as follows: Angouleme, Anjou, Bosc, Clapp's Favorite, Clairgeau, Col. Wilder, Dana Hovey, Easter, Glifford, G. Morceau, Kieffer, P. Barry, and Seckel.

In the Sierra Nevada foothills it was proved experimentally that the Bartlett was largely self-sterile. The best pollinators were Winter Nelis, Bosc, Comice, and Anjou, in the order named. At Chicago Park, Nevada County, there is a solid block of 1000 Bartlett pear trees about 25 years old, for the cross-pollination of which no provision has been made. About eight miles away there is a small block of Bartlett trees of about the same age and vigor, but many of them have been top-worked to other varieties. Both orchards bloomed profusely in 1918. The second orchard, in which there was provision for cross-pollination, produced a crop three times as large as the orchard in which the flowers were self-pollinated. Of the other varieties of pears grown in the Sierra Nevada foothills, Anjou, Comice, Dana Hovey, and Barry were practically self-sterile. In all cases Bartlett has proved a satisfactory pollinator for other varieties.

Nature of Pear Flower

A pear flower remains in bloom seven or eight days. The stigmas mature one or two days before the anthers, and, if the weather is warm and clear, they protrude in front of the flower before it fully opens, thus favoring cross-pollination by insects. But if the weather is cold and rainy, the flowers remain closed, and the stigmas may not be exposed until the anthers have discharged their pollen and perhaps have effected self-pollination. The stigmas remain in a receptive condition for four or five days, but the anthers shed most of their pollen in about three days.

Pear flowers are attractive to a great variety of insects. If the weather is cool very little nectar may be secreted, but under favorable conditions it may be formed so rapidly that it falls in large drops to the ground. The flowers have a fishy odor, or as Kirchner puts it, "smell like cockchfers" (due to trimethylamide). Mueller collected 30 species of insect-visitors in Germany; and Waite in the United States found more than 50 kinds. Honey bees are very common and the most efficient pollinators; but at Washington, D. C., and at the Connecticut Experiment Station solitary bees belonging to the genera *Andrena* and *Halictus* (small bees which burrow in the ground) outnumbered all other insects. Many flies and beetles also visit the flowers, but bumblebees are comparatively rare. Flies are found on the flowers when it is too cold for bees. At least one hive of bees in each quarter acre is necessary for the proper pollination of the flowers.

I had under observation a medium-sized pear tree in full bloom for an hour and a quarter, but during this time saw no insects except honey bees, which were very numerous. A cluster of seven flowers received eight visits in a quarter of an hour, and two other adjacent clusters consisting of 16 flowers received 16 visits. This was an average of a little more than four visits to each flower per hour. The petals from one of the above clusters, consisting of eight flowers, were now removed. During 15 minutes the adjacent cluster, which still retained its petals, received 11 visits, while not one was made to the cluster without petals. The petals are clearly an advantage for the attraction of insects.

Status of Pear Industry

According to the census of 1920 the number of pear trees of bearing age in the United States was in round numbers 14,600,000, showing a decrease of half a million trees in 10 years. The number of trees not of bearing age was 6,000,000, showing a decrease of more than 2,700,000 in 10 years. All parts of the country showed a decrease except the Pacific states, which showed the immense increase of 2,688,000 pear trees of both ages, almost wholly due to California. In 1919 there were harvested in the United States 14,200,000 bushels of pears, or 5,300,000 more than 1909. The total crop of pears in California in 1919 was a little less than 5,000,000 bushels.

Missouri Apple Varieties

ACCORDING to a survey of commercial orchards taken during the present season by Federal and state authorities in Missouri, the Jonathan is now the leading apple of the state. The Delicious, Stayman Winesap, Grimes Golden and York Imperial are rapidly replacing the Ben Davis, Gano and Ingram. Winter varieties constitute about 67 per cent of the bearing trees; fall varieties make up about 28 per cent; summer apples are classed as one per cent; and miscellaneous varieties make up four per cent of the bearing trees.

THE USE of oiled paper wrappers, developed recently by the Bureau of Plant Industry, United States Department of Agriculture, to control scald in boxed apples, has now become common among apple growers. These wrappers have not controlled apple scald completely, but they have caused such a marked reduction in this trouble that the trade recognizes them as an essential part of the industry.

Another method of using oiled paper developed by the department is in the shredded form for the prevention of scald in barreled apples. Paper in this form was tried out for some time experimentally and last year a number of commercial growers in the East used it to a small extent. It has been found that one and one-half pounds of the shredded oiled paper, well distributed through the barrel, produces fairly satisfactory results.

AMERICAN FRUIT GROWER MAGAZINE: You certainly have a fine fruit magazine. It can't be beat. I have never seen or read a finer one than this.—*R. A. Wesenberg, Wisconsin.*

Nitrate of Soda Benefits Cherries

By Carl Woodward

CHERRIES apparently respond more readily to nitrogen than to the other principal fertilizer ingredients, according to the results of experiments recently concluded at the New York Agricultural Experiment Station at Geneva. Of the various fertilizer materials tested, nitrate of soda caused the most vigorous growth and has given increases in yields.

Investigations were begun in 1914 for the purpose of determining the effect of different common fertilizing materials, individually and mixed in varying proportions, upon the growth of cherry trees. The tests were continued for nine years and are reported in detail in Bulletin 503 of the Geneva station.

An orchard of the Montmorency variety near Geneva was chosen for the experiments. When the work was begun, the trees varied in age from three to seven years, but each experimental plat contained an equal number of trees of the same age. There were 10 plats of 18 trees each.

Comparisons were made between the following annual treatments here given in approximately the number of pounds applied per acre:

1. Nitrate of soda only	275 lbs.
2. Nitrate of soda	275 lbs.
Acid phosphate	550 lbs.
3. Nitrate of soda	275 lbs.
Acid phosphate	350 lbs.
Muriate of potash	250 lbs.
4. Nitrate of soda	275 lbs.
Acid phosphate	550 lbs.
Muriate of potash	125 lbs.
5. Acid phosphate	550 lbs.
Muriate of potash	125 lbs.

Two other treatments were tested, identical with No. 5, except that in one case basic slag replaced acid phosphate with an equivalent amount of phosphorus, and in the other rock phosphate replaced the acid phosphate with three times the amount of phosphorus. Also, there was an adequate number of check plats which received no fertilizer.

The fertilizer was applied at the time of plowing in the spring. The resulting growth was measured by the increase in the diameter of the tree trunks. The average increase in diameter per tree and average yield per tree for the nine-year period, for the different treatments, were as follows:

	Growth. (Ins.).	Yield. (Lbs.).
Nitrate of soda alone	3.91	31.7
Nitrate of soda and acid phosphate	4.05	31.3
Nitrate of soda, acid phosphate and muriate of potash (No. 3)	3.91	39.8
Nitrate of soda, acid phosphate and muriate of potash (No. 4)	3.99	39.2
Acid phosphate and muriate of potash	3.53	27.7
Basic slag and muriate of potash	3.48	31.0
Rock phosphate and muriate of potash	3.79	28.8
Untreated plats	3.39	28.6

The above summary shows that for the nine years all fertilizer mixtures containing nitrate of soda gave consistently more growth than those which contained no nitrogen. The treatment consisting of nitrate and acid phosphate gave the largest increase over the check plats, although the complete mixtures were not far behind. Likewise, nitrate of soda alone gave increases almost as large as in combination with other ingredients. The mixtures which contained no nitrogen fell far below the others, being only slightly above the checks.

From the consistency of the results, it seems certain that the nitrogen was principally responsible for the superior growth of the trees in the best plats.

In the average yield per tree we find similar differences. The complete fertilizer mixtures, containing nitrate of soda, acid phosphate, and muriate of potash, gave the best yields. Nitrate of soda alone gave an increase over the untreated plats, as did nitrate with acid phosphate, and also basic slag with muriate of potash, but the differences are not so striking.

In the detailed discussion of the experiment, as reported in the bulletin, the investigators report that the yield data for the individual trees are less consistent than the growth results. Between the average growth and the average yields, however, there is a generally close correlation. It is interesting to note also that in the last three years of the experiment, the treated plots were more regularly superior to the untreated in yield than was found the first four years. This might indicate that the full benefits in yield do not always appear at once but may come in later seasons, possibly indirectly as a result of previously stimulated wood growth.

A REFERENDUM conducted through the mails by the California Peach and Fig Growers recently resulted in a vote of about nine to one in favor of continuing the association in a reorganized form. Sixty-five per cent of the growers favored a single association for handling peaches and figs, and 35 per cent favored separate organizations for handling these products.

At a recent meeting in Fresno, which was attended by representatives of 33 districts, steps were taken to revamp the organization so that it will be a real democracy, in which the members will select those responsible for the management. It was decided to adopt a new contract which would be strong enough to force members to respect their agreements.

The president, in addressing the association, stated that the organization was practically free from debt. He expressed it as the desire of the officers that such changes as might be adopted should have their origin in the council of the chosen representatives of the growers.

Recently, Dividend No. 7 was paid to the stockholders. The rate was eight per cent and the amount distributed exceeded $100,000. Vigorous efforts have been made the last few months to find buyers for the products in the hands of the association. Final settlement has been made on the 1922 crop of figs for canning. All fruit has been contracted for with the exception of about 800 tons of figs of all varieties. The report estimated that the entire 1924 crop and all hold-over fruit would be sold shortly after the opening of the new year. On another page is given an account of more recent developments in reorganization plans.

The Fruit Grower's Dooryard

(*Continued from page 7*)

develop unhampered by others, but even these single specimens can usually be placed close to the border planting so that they look related to it.

By border planting is meant that method of arrangement whereby one may have plenty of beautiful shrubs without the spotty effect of scattered planting over the entire lawn. After it has been decided which are the best long views to be preserved, an irregular border of shrubs may be planted with openings left at the points where an unrestricted view is desired.

In preparing for border planting, it is well to mark off what is to be the edge of this planting, and this line should be curved and flowing rather than a mere straight line parallel to the boundary of the yard. Let it extend out in bays here and there somewhat, as shown in the illustration, which is meant to be suggestive only. Then the entire bed should be dug up, not just a separate hole for each shrub.

Thickness of Planting

When it comes to the planting, the fruit grower's knowledge of fruit tree planting should come to his aid, but it must be remembered that in these border plantings the shrubs should be set sufficiently close that they may make a continuous border when mature, and yet at the same time it must be remembered that crowding will ultimately injure the shrubs. As a rule catalogues may be depended upon to give relative distances apart as well as height at maturity. This last may seem like an unnecessary bit of information at planting time, but suppose you were to plant a low-growing shrub at the extreme back edge of your border bed, and then put some tall-growing shrubs in front. Just how are you going to enjoy the dwarf shrub unless you go around onto your neighbor's land?

Plant Tall Material in the Rear

A good rule to follow is to plant taller material at the back, medium plants in front of these and the lower-growing specimens at the front of the border. There are places, of course, where you may wish to have the tall shrubs at the fore, as at the end of beds for points of accent, or where you wish to call attention to the beauty of a particular specimen.

Where one is fond of color, the beauty of the shrubbery border can be greatly increased and its season of bloom prolonged by outlining the beds with a planting of early-blooming bulbs, and placing just back of these at irregular intervals groups of perennials. By this method there may be a continuous flowering all through the

SUGGESTED PLANTING LIST.

Hardy Shrubs.

	Approximate Height.	Blooming Season.	Color.
Japanese Barberry, **Berberis Thunbergii**	3–4 ft.	June	Yellow
Slender Deutzia, **Deutzia gracilis**	3	May–June	White
Flowering Almond, **Prunus japonica** var. **roses plena**	3–5	May	Pink
Bridal Wreath, **Van Houttei's spiraea**	6	May–June	White
White Kerria, **Rhodotypus kerriodes**	5–6	June	White
Jap. Quince, **Cydonia japonica** (several varieties)	5–6	May	Various
Weigelia, **Diervilla florida** (several varieties)	6	June–July	Various
Persian Lilac, **Syringa persica** (several varieties)	6–8	May–June	Various
Common Lilac, **Syringa vulgaris** (several varieties)	8–10	May	Various
Althea, **Hibiscus syriacus** (several varieties)	8–10	Aug.–Sept.	Various
Elder, **Sambucus nigra aurea**, Golden-leaved	6–8	July	White
Elder, **Sambucus canadensis**, American black	10	June	White
Sumach, **Rhus typhina**, Staghorn sumach	15	July	White
Paniculate Hydrangea, **Hydrangea paniculata**	8	Sept.–Oct.	White to red
Red Dogwood, **Cornus stolonifera**	6	June	White
Red Osier Dogwood, **Cornus sanguinea**	6	June	White
Viburnum (several varieties)	6–8	May–June	White
Common Shadbush or Juneberry, **Amelanchier canadensis**	15	May	White
California Privet, **Ligustrum ovalifolium**	15	June	White
Amoor River Privet, etc., **Ligustrum amurense**	6–10	June–July	White
Golden Bell, **Forsythia viridissima**	8	April	Yellow
Redbud or Judas tree, **Cercis canadensis**	Small tree	April	Pink-purple
Pussy Willow	10	March–April	White
Bush Honeysuckle	6	April–May	Pink

Perennials.

Columbine, **Aquilegia** (several varieties)
Perennial Phlox, **Phlox paniculata**
Moss Pink, **Phlox subulata**
Lilies (many varieties)
Peonies (many varieties)
German Iris (many varieties)
Japanese Iris
Spanish Iris
Rose Mallow, **Hibiscus** (several varieties)
Oriental and Iceland Poppies
Shasta Daisy
Roses
Chrysanthemums
Hollyhocks
Golden Glow, **Rudbeckia**
Bleeding Heart, **Dicentra spectabilis**
Blanket Flower, or **Gaillardia**
Bluebells
Hepatica
Bloodroot
Wild Ginger
Dogtooth Violet
Trillium
Dutchman's Breeches
Anemone
Jack-in-the-pulpit
Black-eyed Susans
Many others

Annuals.

Sweet Peas
Cosmos, both early and late flowering
Larkspurs
Pansies
Nasturtiums
Shirley Poppies
Candytuft
Coreopsis
Calliopsis
Asters
Verbena
Phlox Drummondii
Marigolds
Zinnias
Sun Flowers
Snapdragons

Vines.

Five-leafed Ivy, Parthenocissus quinquefolia
Bittersweet, Celastrus scandens
Trumpet Vine, Lonicera sempervirens
Grapes, Fox, or Frost, or other wild varieties
Illinois Rose
Other climbing roses
Wild Clematis, **Clematis virginiana**
Clematis, cultivated varieties
Japanese Honeysuckle
Hall's Honeysuckle
Wistaria
Boston Ivy
Moon Vine
Morning Glory
Madeira Vine
Cucumber Vine
Passion Vine
Matrimony Vine

Bulbs.

Crocus
Tulip
Hyacinth
Daffodil
Narcissus
Jonquil
Lily-of-the-Valley

Planting List to Attract the Birds.

Flowering Currants
Mulberry (Russian)
Sumacs
Elders
Juneberries
Haws
Dogwoods
Barberry (The birds will eat the berries in February and March when everything else fails)
Privet (A flock of 18 cedar waxwings ate these berries greedily on the twenty-sixth of March last year)
Rosa rugosa
Viburnums
Weigelias—The favorite of the hummingbirds
Chokecherries
Wild cherries
Virginia Creeper
Bittersweet
Catbrier
Spiceberries
Frost grapes

growing season. Reference to the planting list will help in selecting material with this end in view.

Beware of Clashing Colors

Speaking of color must remind almost every reader of some time or other when his teeth were set on edge by the sight of purple clematis and red ramblers, or scarlet sage or geraniums against a red brick wall. If you are not pained by such combinations, avoid them for the sake of sensitive passersby. Who knows but what some temperamental buyer may be driven away from your roadside fruit by just such a shock? But since really lovely color combinations may be achieved by a little care, why not work for them?

As everyone who is at all observant knows, some shrubs are coarse in growth and texture of foliage, while others are said to be of refined and delicate character. As a rule the former should be used in the more remote plantings as a background in border planting, whereas the more refined material is properly used about the entrance way. The same rule applies to the vines which are to be used upon the house and porches.

How to Use Annuals

Annuals are of so many varieties and many of them are so lovely that a place should be kept for them near the house and at the rear if possible. A still better plan is to put the annuals in the kitchen garden, where they will be continually cultivated and where weeding will be a less unpleasant pastime. By this method there is no yawning hole when the last flower of autumn has been gathered to its fathers.

It is not at all unlikely that a market for the less perishable annuals and perennials might be created along with the fruits that are to be displayed at the roadside market, but this should not be their primary purpose. Bear in mind that you and your family need their beauty and their fragrance to help lift you towards better individual and community standards.

Apple Aphids and Their Control

(*Continued from page* 3.)

What Is the Best Material to Use for Killing the Apple Aphis?

Up to the present time one of the best sprays for controlling the aphis is lime-sulphur at dormant strength with the addition of 40 per cent nicotine sulphate used at a dilution of one to 800, or one pint in 100 gallons of spray mixture. Such a mixture applied at the tip green stage of the apple and with sufficient thoroughness to cover the tips of the buds will kill every aphis hit by it. Oil sprays used for scale control plus nicotine sulphate at the same dilution are equally or a little more effective. The results with the oil sprays (alone) at scale strengths have varied somewhat in the different states where experiments have been carried on. Summing up these results, it would appear that most aphids which are thoroughly wet with the oil sprays are killed. Those which are only partly wet may survive. It seems probable from the results of these experiments that the rosy aphis is the most resistant species and is more apt to survive than either the green or oat aphis.

Apple aphids hatching on apple twigs in the spring just as growth is starting (Mo. Agr. Exp. Sta. Bul. 216)

In New York, recent experimental work carried on by Prof. Parrott at the Geneva station shows almost as good results from the delayed dormant oil sprays as from the nicotine sulphate, lime-sulphur solution, the latter killing about three per cent more of the aphis than the dormant strength oil. Prof. Parrott also found that his best kill from dusting with tobacco dust was not obtained in the delayed dormant stage but in the cluster bud stage, when a good control was obtained by the use of a two per cent nicotine dust.

Conclusion

On the whole, it is doubtful if it will pay an orchardist in the Mississippi valley to apply a nicotine spray each season for the control of aphis. He should examine his trees closely to note the number of aphis eggs present and watch for the time of hatch of these eggs. If the aphids are very abundant at the time for the delayed dormant spray, and the weather is cool, apply either an oil and nicotine, or a lime-sulphur and nicotine spray. If one is equipped with a dusting outfit and does not wish to put on a spray at this time, having already applied a dormant spray to the orchard, it would seem best, judging from Prof. Parrott's experiments, to wait until the cluster bud stage in the development of the apple and apply a two per cent nicotine dust at this time. If aphids do not appear to be abundant until the time of the pink or calyx spray, it is extremely difficult to control them, and in most cases applications of nicotine at this time as a spray will not pay for the expense of the treatment. Always bear in mind when spraying for aphis that very thorough work must be done as only those aphis are killed which are hit by the spray.

performed, it is claimed. Those who have inspected the work of the machine, which has been in operation since April of last year, state that the work is done as well as with hand dusters.

The saving effected is (1) labor, one man being able to do the work of several; (2) gasoline, one engine doing the work of two; and (3) time, 100 acres being disposed of in the time other machines would take to do 35 or 40 acres.

The machine was constructed in the machine shop on the Driver ranch.

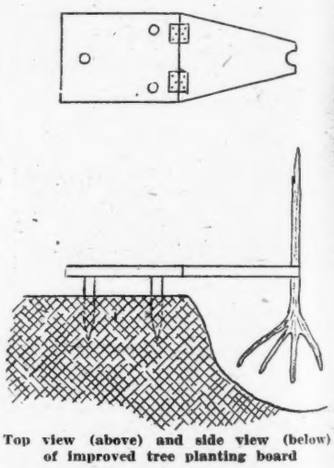
The cost of operation, exclusive of sulphur, is said to be about 15 cents per acre.

An Improved Planting Board

by John J. Pinney

A PLANTING board that has been used to plant thousands of acres of cherry trees in the famous Door county section of Wisconsin has many advantages over other styles. Most boards require two stakes to hold them in place and the boards themselves have to be removed while the holes are being dug. The "Door county style" board eliminates these extras.

This board consists of two parts hinged together. The stationary part is made of one-inch stuff about nine by 12 inches. This part is furnished



Top view (above) and side view (below) of improved tree planting board

with three sharp pegs which, when forced into the ground, hold the board rigid. The hinged part of the board is also made of inch stock and is tapered to about three inches at the free end. This free end is notched deeply.

Operating the board is a simple process. Place the notch against the stake that marks the location for a tree, then force the pegs of the stationary piece into the ground. Throw back the hinged board, pull out the stake, and dig the hole. When the hinged board is dropped down again over the hole, the notch will mark the exact location for the tree. In planting the tree, push it up against the notch, hold it perpendicularly and your tree will be in the position formerly occupied by the stake.

Combination Tractor and Sulphur Blower

By C. B. Castle

A COMBINATION tractor and sulphur blower which saves time and money has been perfected by Paul Driver, who, with his father, C. B. Driver, operates 1200 acres of vineyard in the Dinuba district, Tulare county, California.

The machine will do 100 acres a day, which, it is claimed, is more than twice the speed with which most equipment will function.

The idea is simplicity itself. On a Fordson tractor is installed a Niagara duster, which is belted to the pulley wheel on the side of the tractor.

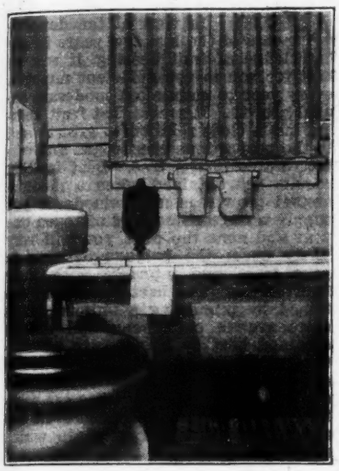
Four rigid "snouts" protrude from the machine, two on each side, by which exceedingly efficient work is

Tractor with duster attached, in use for dusting grapes

The Home That Grew

(Continued from page 5)

This tank could not be located in a basement because of danger from freezing, but that is not possible in a good cave. At first we pumped the water into the pressure tank with a gasoline engine and the water was heated with an oil heater, but this was about as unsatisfactory a way as possible, except carrying it in in a bucket. The pressure was sure to get low just when I needed it the worst and when the engineer, my husband, was at the other side of the farm. And in cold weather anyone who has ever associated with a gasoline engine knows that they are as temperamental as a grand opera singer or a Ford car. But we worried along with it for three years until there came a glad day when we installed an automatic electric pump in the cave, and now the pressure is kept between 20 and 40 pounds night and day, rain or shine, winter or summer. At the same time we put in the range in the kitchen with the water front,



A view of the bathroom in the house originally intended as a barn

and except in hot weather when I am using my oil stove I always have plenty of piping water night and day. This is, I think, the perfect water system for the country home. I forgot to mention that the toilet empties into a sewer that carries all the waste to a ditch 700 feet from the house.

Outside Beauty Spots

Now, I must tell you about our outside beauty spots. The house is surrounded with pretty shrubbery, and if anyone doubts that it adds to a home to nest it in shrubbery, compare the photographs of our house taken before and after the shrubbery was out. There is no comparison. Our front entrance walk, which is 40 feet long, is bordered with Anthony Waterer Spirea, which blooms all summer with a bright blossom and makes a very beautiful picture from the living room. It is the prettiest thing on the farm, except one thing. That is the spirea along the driveway. Our house sets in the middle of the farm on the highest spot and from our windows we can see all over Atchison and for miles in every direction, so there is quite a long driveway to the house. This driveway is a little less than a quarter of a mile long and is bordered on both sides with Carolina poplars and between these trees is the white spirea. Can you imagine that drive in the spring, bordered with a mass of white bloom? In the moonlight it is nothing less than a dream. The neighbors several miles across the country say they can see that lane and that it resembles a long snowbank.

My husband has a rose garden just outside the dining room windows with 36 varieties of roses. And another thing that makes life more pleasant for us is our croquet ground. It is just across the driveway from the yard and is wired with electric lights so that we can play in the summer after dark.

The Orchard and Small Fruit Plantation

The fifth year that we owned our place, we set 25 acres of 40 newly acquired acres to apples. These trees are set 40 feet apart in rows 30 feet apart. In the 40-foot spaces we set peaches, pears, cherries, and plums for fillers, and in between the rows we planted strawberries. We will pay the way of the trees with our berries.

We never have any trouble to get pickers as we are so close to town. The pickers always bring their lunches, as does all the help on the farm. We find it necessary now to employ lots of help not only in fruit picking time, but for cultivating and spraying and other work. On a cold day I often hand out coffee or something warm, but being so close to town I never had the bother of furnishing board except the time that our dearly beloved pointer dog ate up some of the lunches of the grape cutters, and then I was up against it. We keep everything well cultivated and it surely does pay, because we have a reputation for big berries, big grapes, etc. We intend to keep right on setting out more and more until we have the whole 70 acres in fruit and we only have to wait about six more years for our apple orchard to begin bearing.

I have not intended to brag, although I'm afraid I have done so. But since we have planted every tree, shrub, flower and vine on the place and have transformed raw acres into vineyards, orchards, and spots of beauty, all of which has been done with thought, work, sacrifice and planning, I think that we have some excuse for being a little bit proud. And I have only tried to tell why to us it is the most beautiful and convenient home in the world.

FROM the results of four experimental trips, the United States Department of Agriculture believes that citrus fruit can be effectively carried from San Juan, P. R., to New York under present ship refrigeration conditions, provided the fruit is handled carefully at the packing house, in loading and stowing on the ship, and is placed under refrigeration as soon as possible after it is packed.

The experiments are discussed in Department Bulletin 1290, Transportation of Citrus Fruit from Porto Rico, just published by the department.

Probably the most important point brought out by the experiments was that the interior of the load was cooled much more rapidly if it was stowed with dunnage so that the cold air could circulate on at least two sides of each box. In loading warm fruit in refrigerated ships where it is intended to cool it down, there is no question that methods should be followed similar to those found best in cold-storage houses and precooling plants on land. Exact records were obtained of the rate of cooling in different parts of the ship and under different methods of stowing, which should be of interest not only to shippers of citrus fruit, but to shippers of other perishable products in refrigerated vessels.

Less attention has been given heretofore to the problems of transporting perishables on water than on land. Indications are, though, that with the increasing demand for citrus and other fruits water is bound to become a more important means of shipment.

Copies of the bulletin may be had free, as long as the supply lasts, from the Department of Agriculture, Washington, D. C.

AMERICAN FRUIT GROWER MAGAZINE: The writer has been a subscriber to your magazine for a number of years. I am simply writing to tell you that we appreciate every copy. We obtain much valuable information from it, and we in turn gladly forward much of the information to our shippers. The one pity is that every orchardist who is progressive in these United States does not subscribe for it.—*E. L. F., Richmond, Ind.*

The Editor's Mail Box

Fertilizing Fruit Trees

AMERICAN FRUIT GROWER MAGAZINE: My apple trees made a small growth last year and the foliage was thin and had a pale color. Do I need fertilizer? If so, what is the best kind to use?—J. E. K., Illinois.

ANSWER: In all probability your trees need nitrogen. Nitrogen encourages wood growth and makes the leaves larger and darker in color. A fairly good annual growth and healthy foliage are essential for good fruit production.

A good application of manure every year or two will supply the nitrogen required. It is an advantage to plow the manure under, though this is not always done.

In view of the scarcity of manure, many fruit growers are using nitrate of soda or sulphate of ammonia as a source of nitrogen. Both are quite soluble and become quickly available. They should be applied early in the spring, just about the time growth is starting. There is a growing tendency toward applying the material in two applications instead of one, since the trees are thus fed over a longer period and less material is lost through drainage waters.

Some growers work the fertilizer into the soil, but most of them simply break it into small particles and spread it over the surface. Rains and soil moisture will cause its absorption by the soil in a short time. The fertilizer should be spread out under the branches of the trees where the feeding roots are present. There is no need of applying the material against the trunks.

The amount of nitrate or sulphate to use will depend on the age and condition of the trees. Young trees and vigorously growing old trees will require little or no nitrogen, while old trees making a small growth may require as much as 15 pounds. Growers in some sections are using about one-fourth pound per tree for each year of age of the trees. An eight-year-old tree, for instance, would receive two pounds under this plan. This program is not far from being right under average conditions. It is far better to apply only enough nitrogen annually to keep the trees growing steadily than to apply large amounts one year and none the next. In the latter case, the carbohydrate-nitrogen balance of the trees would likely be upset and fruit bearing interfered with.

Nitrate of Soda or Sulphate of Ammonia

AMERICAN FRUIT GROWER MAGAZINE: One of our local agents tells me that nitrate of soda is best for fruit trees. The other advises me to use sulphate of ammonia. What do you think?—J. A. S., Massachusetts.

ANSWER: Several years ago it was thought nitrate of soda was best because the nitrate form of nitrogen can be used directly by plants without change. Other forms of nitrogen, it is believed, must first be changed to the nitrate form by soil bacteria before the nitrogen can be used by trees and other plants. Since the soil bacteria are not active at the low soil temperatures prevailing in early spring, when we apply nitrate of soda, it was thought that sulphate of ammonia could not be so effective as nitrate of soda.

However, the results in practice have not upheld this theory. In practice the sulphate has given as good and apparently as quick results as the nitrate. Either the nitrogen in sulphate is changed to nitrate forms in appreciable quantities at lower temperatures than we have heretofore believed, or plants are able to use some nitrogen in other than the nitrate form.

The objection has also been raised to sulphate of ammonia that it tends to increase soil acidity. It may do this to a certain extent, but the amount of acid cannot be an important factor. The amount of sulphate used compared with the amount of soil involved is a negligent factor so far as increasing soil acidity is concerned.

The question largely resolves itself into a matter of cost of the nitrogen carried by the two forms. Commercial nitrate of soda contains about 15 per cent of nitrogen or 300 pounds to the ton, while ammonium sulphate contains about 20 per cent of nitrogen or 400 pounds to the ton. If you will divide the cost per ton by the number of pounds of nitrogen in a ton, the result will be the cost of nitrogen per pound to you.

Maintain a Uniform Moderate Growth

AMERICAN FRUIT GROWER MAGAZINE: I used nitrate of soda last spring and my trees made a good growth. I was thinking of not using any nitrogen this year. What do you advise?—W. R. I., Virginia.

ANSWER: In view of the developments of the last few years in our knowledge of fruit bearing, it will be best for you to use sufficient nitrogen every year to maintain a moderate annual growth. It seems that fruit bearing has a close relation to growth and to the proportions of nitrogen and carbohydrates in the tree. Best fruiting results are obtained when a medium annual growth is maintained. If you supply a large amount of nitrogen one year and none the next, you will very likely upset the balance existing in your trees and interfere with their fruitfulness. The best results are obtained by promoting a uniform, moderate growth each year, and this is obtained best by a moderate application of nitrate of soda or sulphate of ammonia each year. Watch the amount of growth your trees are making. This is the best guide to the amount of nitrate or sulphate which should be applied.

Creosoted Posts for Grapes

AMERICAN FRUIT GROWER MAGAZINE: I want to build a grape trellis this spring. What kind of posts is the best? Would creosoted posts be better than untreated ones? Would the creosote injure the roots?—J. K. E., Missouri.

ANSWER: Your question is a good one. Concrete posts are long-lived, but they must be well reinforced to prevent excessive breakage, and the fastening of the wires presents a problem. Furthermore, concrete is somewhat expensive. Wood posts are still most commonly used.

Creosoted posts are better than untreated ones for grape trellis. It may be that the creosote will affect the roots for a few inches away, but this effect, if any, is in all probability of no importance. Roots do not develop in directions where conditions are uncongenial, and, furthermore, there will always be plenty of soil away from the posts for their activities. I have never received any report of creosoted posts producing any apparent injury to the vines.

The creosoted posts undoubtedly will last longer than ordinary posts. They do not harbor insects, diseases, or mice, and so far as known they do not injure the plants.

Top-Working Apple Trees

AMERICAN FRUIT GROWER MAGAZINE: I have a number of apple trees of undesirable varieties and want to change them to Jonathans. Please give me directions. —J. K., Iowa.

ANSWER: You can change any apple tree to another variety by means of cleft grafting. The best time to do the work is in late winter just before growth is started. It is not advisable to top-work diseased trees.

The limbs should be cut off at points where they are from one to one and one-half inches in diameter. Cut them off square, where there are no knots.

(*Concluded on page 26*)

A New Method of Pruning Black Raspberries

(*Continued from page 4*)

of great importance. As these figures indicate, the size of the berries was much larger on the plants with the severely pruned laterals. The quality also was much improved. The saving in labor of picking, that is very plainly shown here, is an important factor in these days of high wages and scarcity of pickers.

It has already been pointed out that severe pruning of the laterals forced the buds on the main portion of the cane into a vigorous growth and the production of very high quality fruit, and also that the opposite condition prevailed when the laterals were left medium or full length. It is interesting to note that the yield from the main portion of 10 canes with severely pruned laterals was 25 ounces, while for the same number of canes with medium length laterals the yield was 4.8 ounces, and for full length laterals it was 2.1 ounces. This shows that the response of the buds on the main portion of the cane, coupled with the increase in size of the fruit from all portions of the cane, enabled the plants with the short-pruned laterals to produce such satisfactory results.

Good Foliage and Good Cultural Methods Necessary for Heavy Production

The foliage on the canes with short-pruned laterals was much greener and healthier looking than the foliage on the canes with longer laterals. Leaf measurements also showed that the individual leaves were much larger. The importance of a large, healthy leaf area is evident when it is stated that as the average leaf area per fruiting shoot increased from 6.44 square inches to 54.6 square inches, the average weight of fruit per shoot increased from 0.33 to 0.94 ounces. Accompanying this increase in total yield, the average weight per berry increased from 0.042 ounces to 0.069 ounces. It is apparent, therefore, that the raspberry grower should attempt to produce on his plants a large, healthy leaf surface, and then protect this leaf surface from injury. Great loss has resulted in many cases from spray injury.

It has been a common practice to pinch the tips out of the new shoots at about the height of 18 inches in order to produce a low, sturdy cane that would not bend over to the ground under the weight of the crop. However, this investigation shows that the buds on the main portion of the cane are very desirable buds, provided the laterals are pruned severely enough to force them into a vigorous growth. It probably would be wise to allow the new shoots to grow to a height of 24 inches before pinching off the tips. In this way several more buds would be added to the main cane. The objection that the fruiting canes might bend over into the middles if left higher is not so important when the laterals are pruned so severely. The weight of the crop is borne near the main cane, and, as a result, very few canes bend over to the ground.

These investigations emphasize the importance of good cultural operations in the raspberry plantation. Good cultivation, effective control of insects and diseases, and maintenance of soil fertility, play an important part in increasing the size of the canes and in insuring an abundant and healthy foliage. Then if the pruning is such as to prevent the plant from being overloaded with buds, satisfactory yields of high quality fruit should be obtained.

Imported From New England

Gentleman, in a restaurant: "Waitress, I found a hair in my apple sauce."

Waitress: "I don't see how that could be; the apples were all Baldwins."

The Editor's Mail Box

(*Continued from page 24*)

Then split the stub with a grafting chisel and hold the split open with the wedge part of the chisel. The scions should be of one-year-old wood of the desired variety, six to eight inches in length. The bases should be trimmed wedge-shaped, with the inner edge narrower than the outer edge. Two scions are needed for each limb, one being set on each side of the split. They should be set in the split so that the cambium layers (tissue between bark and wood) of the two come in contact with each other. It is desirable to set the scions at a slight angle so that the cambiums will cross at some point. The wedge should then be carefully withdrawn, thus leaving the scions held firmly in position. Grafting wax should be used to cover the scion and the split and cut surface of the branch. It is advisable to top-work about one-third of the tree each year, and thus distribute the work over about three years. It would shock the tree too severely to cut off all the branches in one year.

Bridge Grafting

AMERICAN FRUIT GROWER MAGAZINE: I have some trees that were girdled by rabbits during the winter and am anxious to save them. Please give me your advice.—R. E. J., Arkansas.

ANSWER: Trees injured by rabbits, mice and collar rot can often be saved by bridge grafting. The injured surface of the tree should first be trimmed to a clean, smooth edge at both the top and bottom. Select scion wood of the same variety that is of sufficient length to bridge the area. The base of the scion should be cut straight across and beveled edges about one and one-half inches long should be made. After measuring the scion against the injured surface to determine the length of scion required, trim the top in the same manner. The bark of the tree above and below the wound is split and the edges are loosened. The beveled ends of the scion should then be inserted in the slits, with the beveled edges on the inside, against the wood of the tree. After being pushed into place, the scion should lay reasonably close to the trunk. Following this it is well to tack both ends of the scion to the tree with a slender brad. Additional scions should be set at intervals of about one and one-half inches until the girdled portion is entirely covered. Both ends of the scions should be thoroughly waxed to prevent drying out.

Occasionally when the bark has been very badly injured, it is advisable to plant young trees around the old ones and graft them into the tree above the girdled portion. Many badly damaged trees have been saved in this way, particularly those infected with collar rot.

In a few years a bridge grafted tree will form a new cover of actively growing tissue and thus will be little the worse for its experience.

Formula for Grafting Wax

FORMULA for Grafting Wax .....

AMERICAN FRUIT GROWER MAGAZINE: Please give me a good formula for grafting wax.—A. E. F., New York.

ANSWER: A good grafting wax can be made from four parts resin, two parts beeswax, and one part tallow. Melt these materials over a slow fire. Lump resin should be pulverized before being exposed to the fire. All particles of the resin should be fully melted before the wax is removed from the fire. Allow the mixture to cool somewhat and pour into a vessel of cold water. Grease the hands and pull and work the grafting wax like molasses candy until it becomes smooth. It should then be rolled into balls of suitable size and stored in waxed or oiled paper until desired for use. It will keep indefinitely.

Waxed string for tying grafts may be prepared by dropping a ball of No. 18 cotton string into melted grafting wax until thoroughly saturated. Waxed strips of cloth may be similarly handled.

CHEMICAL changes occurring in combined lead arsenate and lime sulphur sprays may render such materials less efficient against insects and diseases and more injurious to foliage, according to Bulletin 521 recently issued by the New York State Agricultural Experiment Station of Geneva, N. Y. The bulletin was prepared by Dr. R. W. Thatcher and L. R. Streeter and may be obtained free on application.

"When acid lead arsenate is mixed with lime-sulphur solution, a definite chemical change takes place whereby the weight of insoluble solid matter in the spray mixture is nearly doubled," say these specialists. "This solid matter undoubtedly reduces the efficiency of the spray as a check on disease organisms and increases the danger of injury to the foliage when the spray is applied to the orchard.

"Certain materials may be added to the spray mixture which prevent these changes without reducing the killing efficiency of the combined lead arsenate and lime-sulphur spray. One of these is hydrated lime, but this increases the solid residue in the mixture and is therefore not wholly satisfactory. Casein preparations have been found quite satisfactory in preventing these undesirable reactions, and, in addition, they have a so-called 'spreader' effect which may increase the efficiency of the spray under certain conditions.

"Among the casein preparations tested out, skim-milk with added lime was found to have a deterrent effect on the undesirable chemical reactions, and this material seems to hold promise for general use because of its low cost. Further orchard tests are to be made, however, before skim-milk can be recommended. Tobacco dust added to lead arsenate and lime-sulphur sprays for combating certain insect pests also prevented undesirable reactions between the arsenate and sulphur compounds."

Book Review

Farm Life Abroad

"FARM Life Abroad" is the title of a new book by E. C. Branson, Professor of Rural Economics at the University of North Carolina. The book is an account of the observation and study of the author during a trip through Europe in 1923 and 1924. Looking at the European situation through the trained eyes of an economist who sees things from an agricultural viewpoint, Prof. Branson has been able to present an analysis which is different from anything we have been given recently on the European situation. The material is presented primarily from an agricultural standpoint.

The book will make interesting and valuable reading for persons interested in European affairs in their relation to financial and economic conditions in the United States, particularly with reference to agriculture. The book is sold by the University of North Carolina Press, Chapel Hill, N. C.

Practical Farm Economics

"PRACTICAL Farm Economics" is a 100-page bound volume prepared by experts in the United States Bureau of Agricultural Economics, which is being sold by the Superintendent of Documents, Washington, D. C., for 40 cents. The authors aimed to set forth in plain, simple language the economic principles which they feel should be more generally understood, especially by persons interested in co-operative marketing. The volume deals, among other things, with farm management, marketing, and farm credit. The book should prove interesting and valuable to many of our readers.

Book on Pecan Growing

THE PECAN has been attracting much attention the past few years and there has been a large demand for information on the subject. For this reason, the new book on "Pecan Growing," by Stuckey and Kyle, will be welcomed by many persons. The authors seem to have covered the subject thoroughly and ably. Chapters are included on history, commercial importance of the pecan, care and cultivation, growth, propagation, soils and fertilizers, planting and care, harvesting, marketing, insect and disease control, utilization of the pecan, and botanical description and varieties.

The book is one of the Rural Science Series edited by L. H. Bailey. It is sold by the MacMillan Company of New York.

Handling Perishables

"HYGIENIC Principles of Food Handling" is the title of a new book by Thom and Hunter, which will prove of value to persons engaged in marketing and handling perishable products, as well as to household science experts. The book treats primarily the principles of sanitation and relates to all food products of a perishable nature, including fruits, vegetables, dairy products, meats, poultry products, and fish. It is sold by the Williams and Wilkins Company, Baltimore, Md., for $3.

THOSE interested in a statistical study of mortgages on homes in the United States in 1920 may obtain a 277-page book on the subject from the Superintendent of Documents, Washington, D. C., for $1.25.

Canned and Dried Fruit Exports Greatly Increased

EXPORTS of canned fruits increased approximately 52 per cent in volume for 1924, as compared with the previous year, according to the United States Bureau of Commerce. Exports of canned fruits for 1924 reached 224,318,248 pounds, compared with 147,576,375 pounds for 1923. The United Kingdom increased its purchases 70,000,000 pounds during 1924, and Belgium and Germany also showed substantial increases. The export value of canned fruits during 1924 showed an increase of $7,576,602 over that for 1923.

Undoubtedly the most important development in the exports of dried foods for 1924, as well as an item of great importance in the trend of the foodstuffs export trade for the year, was the total exportation of 220,911,703 pounds of prunes, as compared with 59,103,757 pounds exported during 1923. All the European countries showed substantial increases in their importation of prunes from the United States during 1924. Germany's purchases, totaling 89,792,087 pounds of this fruit in 1924, against imports of 2,311,749 pounds for 1923, constitute the principal increase. Norway imported 3,758,196 pounds of prunes during 1924, compared with 96,585 pounds for the previous year.

Dried raisins, apples, and apricots also show a considerable increase in exports during the past year.

Don't Be Misled

DURING the winter a report dated at Munich, Germany, gained entrance into some American papers stating that a new method of planting trees had been found in Germany which would save six years of growth. By this new method, the report stated, the roots of young trees are spread out instead of being placed up and down "as is usually done." The report further quoted the German foresters as stating that it was wrong to pack the earth about tree roots, as this robbed them of breathing space.

The standard American recommendations call for spreading out tree roots according to their natural habit, so there is nothing new in this point for us. The recommendation as to leaving the soil loose about the roots has no sound basis and is not founded on scientific fact. Roots of our common plants were meant to grow in soil and they are out of their place in air. We must provide them conditions in keeping with their natural desires and we must therefore compact the soil about roots when planting trees. It is true that roots need small quantities of air but they will get plenty of air in the most thoroughly compacted soils if they are well drained. We hope that none of our readers have been misled by the above report.

In a Nut Shell

THE CO-OPERATIVE system is the most hopeful movement ever inaugurated to obtain justice for, and improve the financial condition of, farmers and laborers.

The producers are paying all the costs and assuming all the responsibilities of these co-operative associations. They are taking all the risks. They are asking no assistance from the public treasury. They are forcing no one to join and they are exacting no inordinate price for their product.

These associations have become necessary, not only as a matter of justice, but also as a matter of existence to the producers of the great staples of the country and as a protection against the gigantic combination of capital which has been taking all the profits, or more, which should have gone to the producers of the great staple crops of the country, and to furnish a reasonable, decent wage for the laborers in such industries.—*Chief Justice Walter Clark of the N. C. Supreme Court.*

THE CALIFORNIA Peach and Fig Growers, embracing 9500 growers, is conducting a reorganization campaign. After nine years of experience, the association leaders feel they have learned many things that are of great value in the reorganization plan; in fact, the new plan, which was prepared by a committee of 38 growers representing the different districts, is believed to be about the last word in plan, so far as the industry is concerned. In 33 districts of the state the reorganization is being pushed with the utmost rapidity and economy.

The new contract extends for eight years, with no provision for withdrawals. This feature was necessary, in the opinion of the committee, in order to give the officers and manager an opportunity to plan operations with reference to future developments and to place the association on the same business basis as large industrial organizations.

Under the new plan payment will be made to growers more frequently than before. Settlement will be made in December for all fruits sold and collected up to October 31.

The association is out of debt and has assets of over $1,800,000 in plants and equipment. Growers will not need to subscribe to new stock issues.

Financing will be accomplished through a fund of $1,000,000, which will be established by deducting one-half cent per pound for all fruit handled. When the fund reaches $1,000,000 the company will begin paying back the surplus to growers in the order in which contributions to the revolving fund were made by them. This plan has proved sound and efficient with many co-operatives.

The new plan, which was developed by growers' representatives and not by the management, insures a more democratic organization than the old association; it makes the organization conform more closely with national co-operative laws; and it greatly strengthens the financial structure. The growers' committee expressed the opinion that the experience of the last nine years had been of great advantage in drawing up the new plan, and in their belief the new plan will result in one of the strongest co-operatives in the country.

THE ILLINOIS Fruit Exchange was originally organized under the Not for Profit law of 1870. This law was intended primarily for lodges, clubs and societies, although the Board of Trade and National Livestock yards are organized under it. While this law answered fairly well for marketing purposes, the new co-operative law passed at the last session of the legislature is more specific and better adapted for a marketing organization. The exchange therefore is being reorganized under the new law.

The reorganized association is being called the Illinois Fruit Growers' Exchange. A. B. Leeper, General Manager, states that 12 local associations have been formed under the new plan. These are located in the leading fruit counties of the state and at some of the most important shipping points. It is expected that a number of other locals will be reorganized before the opening of the shipping season. The exchange markets apples, peaches, pears, strawberries, and some vegetables.

The exchange has recently perfected its own sales department, employing J. O. Lawrence, who recently resigned from the Federated Fruit and Vegetable Growers, Inc., as Sales Manager. At the date this issue went to press it was undecided as to whether or not relations with the Federated Growers would be continued during the coming year.

IN 1924, its first year of operation, the Yakima Valley Grape Growers' Union, Grandview, Wash., handled 161,911 baskets, 4978 lugs, and 11 tons of bulk grapes, or about one-half of the total shipments from the valley, at a cost of about three cents per basket. Of 35 cars shipped, none were rejected, and allowances were made on f. o. b. prices in only a few instances. Proper grading and packing made these results possible, it is claimed.

Total receipts amounted to $45,894, of which $40,031, or about 90 per cent, was paid to growers. About 75 per cent of the money was in the hands of growers in 30 days after delivery, and final payments were made on October 23. Prices to growers averaged about 21 cents per basket. All sales were made at 25 cents per basket f. o. b. shipping point.

The grapes from the valley mature just after those in Missouri and Arkansas and before those in Michigan. The association has 135 members and hopes to increase the tonnage to 75 per cent of the shipments of the valley before another shipping season opens, according to Manager Thomas R. Robinson.

At the annual meeting in January the following officers were elected: President, E. V. Wyant; Vice-President, R. R. Wardall; and Secretary-Treasurer, Thomas R. Robinson.

THE OZARK Fruit Growers' Association, with headquarters at Monett, Mo., operates in Missouri, Arkansas, and west Tennessee. It has been in existence since 1906 and at present sells the products of about 2000 growers who are united in 57 local associations. Its annual report for 1924, recently issued, contains some interesting information.

A total of 1252 cars were handled in 1924, including 784 cars of strawberries, 69 cars of tomatoes, 185 cars of grapes, 79 cars of apples, 67 cars of peaches, two cars of melons, and 66 cars of cabbage and beans. The total receipts were $1,424,208. The expenses were $47,000 and the net paid to growers was $1,374,550.

THE KEYSTONE Co-operative Grape Association of North East, Pa., reports a business of $715,294.73 in 1924. Grapes were the chief product handled and some small fruit also was sold. Large quantities of baskets, fertilizers, spray material, and general supplies were purchased. Operating expenses were $33,285.

The Keystone Grape Company was organized in 1901, when it established its own "Keystone" brand, which is still in use and has become more valuable year by year. In 1915 the association had 32 members and a paid-up capital of $13,000, and it did a business of $165,548. In 1916 it shipped 162 cars grapes, two cars strawberries, two cars cherries, and some express shipments.

The present company was organized in 1921 and bought the property of the Keystone Grape Company, early in 1922. In October the new association had 218 members. The business has increased from $450,000 in 1921 to

$715,294 in 1924. The balance sheet of December 31, 1924, shows that a refund of $14,326 was made to growers out of the surplus and that there was still on hand a working fund of $25,955. Real estate, buildings, and equipment were valued at $23,786.

THE FRUIT growers of Marshall County, Ind., recently formed an association. The objects are to promote better methods of standardization, to improve methods of cultivation, spraying and pruning, and to foster the cause of co-operative marketing. The association is already pooling orders for berry boxes and spraying material. The officers elected are E. S. Freese, President, and Henry Kelver, Secretary-Treasurer.

THE FEDERAL Trade Commission, which has recently made a study of co-operative marketing, has issued a report which contains some interesting information. There are now about 285,000 co-operatives in the world. It is said that about 120,000,000 persons carry on co-operative buying and selling. In Europe, according to the report, co-operative organizations formed "in many cases the strongest basis upon which reconstruction could be laid following the war.

"In some of the larger countries of Europe, like the United Kingdom, Germany, and France, the consumers' co-operative societies rank among the largest producers and distributors of necessaries of life. In England and in Germany nearly half the population is affiliated with consumers' wholesale and retail societies."

In 1922 the English co-operatives had a net surplus amounting to $70,000,000. The Union of Swiss Consumers had a surplus of 14,455,218 francs in 1921.

Co-operative organizations, according to the report, have become one of the most important features in the economic structure of the world.

Ohio Horticulturists Hold Fine Meeting

THE OHIO State Horticultural Society held one of the most successful conventions of the Middle West this winter at Columbus on February 2-5. The convention was held in connection with Farmers' Week, an annual affair. There was an average attendance of about 250. The large meeting room of the horticultural building at the State University was filled to capacity at practically every session.

President F. H. Ballou, Secretary F. H. Beach and other officers, as well as members of the Department of Horticulture, deserve a lot of credit for this fine meeting. Subjects of outstanding importance were handled by specialists in the different lines. The program was carried through with clock-like precision. One hour was definitely allowed for each address and discussion, and the sessions began and ended on time. With such a program a person interested in a particular subject can easily arrange his time accordingly. It is a system which many other societies would do well to adopt.

President Ballou opened the meeting with an excellent address in which he spoke of the progress made in the fruit industry and the problems ahead. Prof. J. H. Gourley spoke on ringing of trees as a commercial practice, pointing out that while ringing will give important results, it is hardly advisable as a general commercial practice. C. E. Durst of the AMERICAN FRUIT GROWER MAGAZINE spoke on recent developments in the rootstock question. He advised people planting new orchards to insist that the trees be budded or grafted only on vigorous seedlings, as weak seedlings produce slow-growing, unproductive orchards. He also advised the purchase of only the best grade of trees, as the lower grades are quite commonly the result of using weak seedlings. H. F. MacMillin of the Hydraulic Press Manufacturing Company explained the process of his company for preserving apple juice by heating to 160 degrees Fahrenheit and thus preserving the natural flavor without boiling. He urged the conversion of more fruit into fruit juices as a means of improving market demand.

H. W. Johnson of Ohio State University urged the destruction of apple leaves as a means of reducing apple scab infection in the spring. F. H. Ballou outlined the results of spraying experiments at the Ohio State University in 1924. G. L. Lynch of Ohio State University gave an address on planning and planting of home grounds. F. A. Howlett of Ohio State University gave an excellent talk on pollination of apples. An article by him on the subject will be published in the AMERICAN FRUIT GROWER MAGAZINE during the coming year.

J. R. Magness of the Department of Agriculture gave two excellent addresses in which he described the important results obtained in his extensive apple storage investigations, conducted recently in co-operation with a number of experiment stations. Mr. Magness will write two articles for the AMERICAN FRUIT GROWER MAGAZINE, which will appear in the early fall, and it will therefore be unnecessary to include his recommendations here. H. P. Curtis described a home-made grading outfit used in his co-operative association last season.

A. C. Robison, in an address on the accomplishments and goal of co-operative marketing in Ohio, presented one of the soundest and most constructive talks on co-operative marketing that has been given in the Middle West this year. Mr. Robison is on the board of the Ohio Fruit Growers' Association, and the growers are to be congratulated on having an executive of his ability and understanding of the subject. C. R. Cutright presented a paper on controlling apple aphis, in which he stated that excellent results had been obtained by using Black Leaf 40 and home-made oil emulsions.

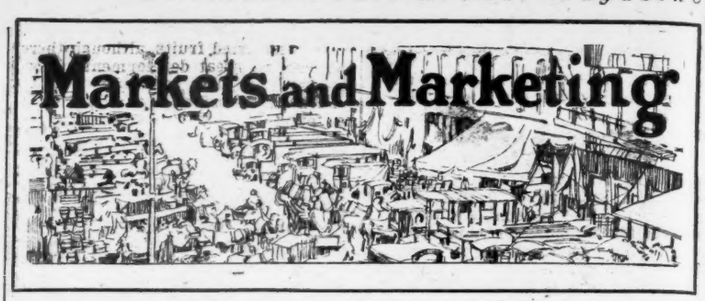
The last session was devoted to talks on orchard dusting by H. C. Young, on bees by C. A. Reese, and on the grape leaf hopper by G. A. Runner.

The reports of the secretary and treasurer showed a membership of 497. Thanks to an increase in dues from $1 to $3, the treasury was expanded from a deficit of $169 at the beginning of 1924 to a balance of about $500 at the close. The annual report will be issued at once.

Resolutions were passed (1) approving a gas tax of two cents; (2) an addition to the appropriation budget providing for the purchase of 10 acres near Wooster for spraying tests; (3) extending greetings to S. R. Moore and W. J. Greene, two elderly members of the society; and (4) requesting the government to extend the quarantine on the Japanese beetle so as to require the removal of all soil from the roots of plants shipped from the infested areas.

The following officers were elected: President, D. R. McConnell; vice-president, L. B. Yaple; secretary, F. H. Beach, and treasurer, W. W. Ellenwood. There was a large and excellent display of fruits, equipment and materials.

"I HAVE many times declared my conviction that the development of a powerful co-operative movement in this country is one of the needs of this period of economic readjustment. There is need for co-operative organizations among agricultural producers to help them both in selling their products for a better price and buying their requirements more cheaply. There is likewise need for the organization of urban consumers to give like benefits. The establishment of a close-working relationship between these two groups ought to be the ideal at which the larger co-operative movement of the country should aim."—*President Calvin Coolidge.*



EDWIN SMITH of the United States Bureau of Agricultural Economics, following a recent study of fruit and vegetable marketing in Europe, stated that an association of fruit buyers controls the auctions in Holland. A representative of the buyers selects the samples of fruit, which are exhibited in the sales rooms. Buyers from outside of Holland must buy through an association member, as they cannot become members. A fee of two and one-half cents per box is charged for this service. Some of the Holland brokers maintain branches in western Germany to develop trade connections.

In normal years Holland and Germany are supplied with domestic apples in the fall. American apples are not in demand until the domestic product is out of the way. The demand for American apples starts about December 1 and becomes fairly strong for the Christmas trade, but the best demand comes after January 1 and lasts until the end of the season. The prices for American fruits have been low early in the season when there has been competition with domestic supplies. Prices later in the season have been fairly satisfactory.

Rotterdam prefers boxed apples to those in barrels. Fancy fruit is in greatest demand. The quarantine of Germany against fruit showing evidence of San Jose scale may also be a factor in the preference for boxed apples, as it is easier to determine the infection in boxed fruit than in barreled fruit.

Before Christmas, red apples are in greatest demand. After January 15, Yellow Newtons are in favor. Among red varieties, Jonathan, Spitzenburg, and Winesap are in favor. Rome Beauties and Arkansas Blacks find a good market if in good condition and bright. The Holland market is not so particular about size as the British markets. Apples in Holland and Germany are sold by the pound and the 150s to 200s are the favorite sizes.

CO-OPERATIVE marketing in the United States dates from the Civil War. The first producers' cheese factory was formed in 1863 and the first fruit and vegetable organization in 1878. Two grain organizations were formed in 1887 and a livestock association in 1890. The movement grew gradually until in 1900 there were several thousand organizations in existence.

From 1900 to 1920 many organizations were formed. The peak of the movement was reached in 1920. More than 800 organizations reporting recently to the United States Department of Agricultural Economics were formed in 1919. In 1920 there were established 973 associations now functioning, and in 1921, 776 associations were organized.

There are now over 12,000 co-operatives in the United States, with a membership of about 2,000,000, and they do a business of more than two and one-half billion dollars annually. Seventy per cent of the associations are in the 12 north central states. Six per cent of the organizations are in the three Pacific Coast states.

The number of associations has increased nearly 200 per cent since 1915. The membership has increased about 300 per cent, and the amount of business in dollars has increased about 200 per cent.

About 50 federations of local associations are now operating in the United States. These federations determine policies regarding standardization and preparation of products and usually have charge of advertising and selling the products. The development of federations along commodity lines in the different producing districts is the outstanding feature of development at the present time.

THE BARR Shipping Corporation of New York City recently announced a new feature in their list of vessel sailings. In addition to giving the sailing dates as in the past, the list also gives the estimated number of days required for crossing from port to port. Such information is of particular value to shippers of perishables, especially those who wish to make certain rail connections abroad for interior shipments. Other shipping companies would perform a service by following this example.

THE RAPID development of fruit growing in South Africa in recent years has emphasized the importance of efficient marketing. After investigating the subject from all standpoints, leaders of that region decided in favor of co-operative marketing. As a result, several organizations, patterned after successful American co-operatives, have been established.

There are at present 32 locals in South Africa with a total membership of about 800. Seventeen locals are handling citrus fruits, four are handling deciduous fruits, and one is handling pineapples. Central associations have been established for the citrus and deciduous fruits, respectively. It is expected that other central associations will be organized as soon as the development of local associations justifies the same.

It appears that the various local and central organizations are affiliated in a general organization called the Fruitgrowers' Co-operative Exchange of South Africa, Ltd. Plans are being made by the exchange to establish a representative in London to assist in the marketing. "Goldland" has been selected as a brand name for fancy and choice products. It is planned to place the trademark on the tissue wrappers used in packing. This brand is to be advertised in England.

A periodical called the "Fruitgrowers' Exchange Bulletin" is published to keep the membership informed about the activities of the exchange. It is printed in English and in Afrikaans. The annual report and financial statements are printed in the two languages.

The exchange is supported by a tonnage charge on all fruit exported. The income for the first 15 months, ending December 31, 1922, was about $35,000, and the income for the year 1923 was nearly $45,000. About 80 per cent of the fruit exported from South Africa is produced by members of co-operative associations.

THE UNITED States supplied approximately one-third of the apples imported by Great Britain in 1923, while less than one-half of one per cent of the oranges received by Great Britain were shipped from our country. Between 10 and 11 per cent of the imports of pears by Great Britain were from the United States.

The development of foreign markets for the exportation of fresh fruits and vegetables presents a problem quite similar to that of distribution within the United States. There have been no extensive investigations of the market possibilities for fresh fruits. Rather thorough investigations have been made, however, for marketing pro-

served and dried fruits, although there has been no great development of foreign trade in these commodities.

Perhaps a considerable market might be found in Latin America and the Orient, especially for green fruits and vegetables, from our west-coast regions. This would necessitate, however, increased refrigerator transportation facilities. Such development requires large initial investment, both in ships and warehouses, and would be possible only through large export trade associations or "co-operatives."

The total value of fresh and dried fruits and fresh vegetables exported from the United States decreased approximately $84,000,000 between 1919 and 1923. The value of fresh fruits alone, however, increased more than $2,000,000. The value of apple exports increased almost $2,000,000. Oranges and pears each showed an increase of more than $750,000. Potatoes, raisins, and onions showed a large decrease in value. Before an accurate inference may be drawn, however, the relative dollar values as affected by exchange and prices for the period 1919-1923 must be considered.—*United States Commerce Reports.*

THE AMERICAN Cranberry Exchange, New York City, is more and more using national advertising in the marketing of the yearly crop of cranberries. The annual expenditures for this purpose, beginning with the crop of 1916, are as follows:

Crop of	Advertising expenditures.
1916	$ 22,941
1917	14,911
1918	54,199
1919	122,698
1920	77,938
1921	73,564
1922	179,774
1923	194,539

The large expenditure in connection with the marketing of the 1923 crop was made necessary because of the size of the crop, it being the second largest in the history of the exchange.

The quantity of cranberries handled by the exchange as measured in barrels, the average f. o. b. price per barrel, including unbranded and pie berries, and the per cent of the total crop handled by the exchange for each crop beginning with that of 1917, is as follows:

Year.	No. of barrels.	Average f. o. b. price.[1]	Per cent total crop.
1917	154,812	$10.40	56.0
1918	209,666	8.89	59.6
1919	331,032	7.86	59.5
1920	282,473	10.39	64.0
1921	244,771	13.54	66.0
1922	373,315	10.33	66.0
1923	[2]390,976	7.95	63.0

[1]Price per barrel including all shipments through the exchange.
[2]To April 1, 1924.

The quantity of berries of the 1923 crop which each of the four producing sections served by the exchange contributed to the total volume, was as follows: Cape Cod, 227,699 barrels; New Jersey, 131,653; Wisconsin, 28,162; Long Island, 3462.

The expense of marketing for the 1923-24 season was $154,729, made up of salesmen's salaries, brokerage, commissions, general expense, travel expense, bad accounts, etc. The expense ratio for the 1923 crop was 5.057 per cent as compared with 4.35 per cent for the 1922 crop, 4.085 per cent for the 1921 crop, and 4.39 per cent for the 1920 crop.

A JOINT program for advertising peaches and grapes was carried out last year by the California Fruit Exchange, which will prove interesting to other associations. An arrangement was worked out by the exchange with the Nebraska-Iowa Jobbers' Association and the Produce Club of Des Moines whereby the latter contributed dollar for dollar with the California Fruit Exchange. Elberta peaches and Malaga and Tokay grapes were the products advertised. The advertising was done principally in western states, the chief cities covered being Des Moines, Omaha, Sioux City, Lincoln, Hastings, Fremont, Norfolk, and North Platte. A careful study will be made of the results so that accurate data may be available for future campaigns.

The Orchard Home Department

By Mary Lee Adams

Neatness in the Home

IT SOUNDS tiresome to be sure. "A place for everything and everything in its place." But "nothing in place" is a lot more tiresome in reality even than picking up, straightening out, putting to rights, or any of the ways in which we express that modest and somewhat neglected virtue of neatness.

Perhaps it is because we never associate genius, talent, aspiration for higher things and all the shimmery moonshine that accompanies "temperament," with any such prosaic stuff. We wouldn't expose ourselves to a suspicion of lacking temperament. Not for worlds. And just suppose anyone should call us old-maidish. How humiliating that would be.

Yes, perhaps that's the reason we don't bother to be neat. And there's another "perhaps." Perhaps it's plain laziness, the easy tendency to put off until tomorrow. Life in the orchard home is busy. When the daily duties are done, surely we may snatch a half hour or so for social diversion. When we come home there's no time left to sort out the linen closet.

We all need social diversion. It's really more important than orderly closets. But how about that "half hour or so" you lost this morning ransacking everything topsy turvy while looking in vain for something that you are perfectly certain you have but can't for the life of you think where it is. Some day, after you've gone to the expense of replacing that article, it will turn up under a heap of rubbish that would better have been disposed of long ago.

"I haven't room to put things away," says one. That's the strongest possible argument for putting them where they belong. They take up lots more room scattered hither and yon. "I haven't time to put things in their proper place," says another. But how much time do you spend looking in vain for the one thing needed? Probably all will agree that, while there's such a thing as painful exactness, a junky-looking home is not the most attractive. But it's worse than that. It's rarely the most harmonious. Daddy doesn't feel particularly pleasant when his socks get jumbled up with the baby's dresses. Mother is slightly edgy when he roars for a bath towel and she can't put her hand on it until she has upset piles of sheets and table napkins.

Even baby cries when the domestic atmosphere becomes tense. But I want to say that the time when untidiness in the home assumes really important proportions is in emergencies. Where, oh! where is that bottle of disinfectant for the cut on Bobby's foot?

After seeing many orchard homes, orderly and otherwise, I give it as my honest opinion that time, money, temper and frequently health, are saved by keeping things in their proper places.

A Long Healthy Life

EVERY now and again the perennially interesting subject of how to live long comes up for discussion. In one form or another, all voice the desire for long life. One says, "I do not care to live with the increasing infirmities of old age," which is but another way of saying that if one could keep on being active and healthy there's practically no limit to the time one would be willing, not to say anxious, to linger in this old world of ours.

So occasionally we try to find out from aged but still active and healthy persons, to what they attribute their immunity from the infirmities of age. The last such inquiry I have noted brings out, as might be expected, considerable diversity of opinion. Some would cut out all stimulants, others would enjoy them in strict moderation. Some assert that early to bed and early to rise is the secret of prolonged youth, others think it makes little difference when we sleep provided we get enough rest. Some say we are worn out by living too fast, while others believe that the more active we keep in thought and deed the younger we remain.

The general idea, however, is that we eat too much, while one and all agree that we eat too much meat. Meat three times a day is universally condemned. To partake of meat, and that sparingly, once a day is plenty for the ordinary person. The man who does heavy physical labor needs heavier and more substantial food. We all know this almost instinctively, yet the reverse of the proposition, namely, that the less we exercise the less we need to eat, does not appear to make the same appeal to our common sense.

One might expect to hear a shout of warning against our normal use of tea and coffee. The survey of the dairy statisticians brings out the astounding figures of twenty-one billion cups of tea and forty billion cups of coffee consumed annually in the United States. But few of the aged dwell upon this habit as injurious. Moderation in such things is generally approved.

An interesting sidelight is thrown on the physical reaction to an existence unpoisoned by anger and hatreds. A quotation from the Talmud says that the very old men, when questioned, said that they attained their great age "by showing kindness and a forgiving spirit to all and by being at peace with God and man." The regular and comparatively placid life of teachers has resulted in their being the longest lived class that our modern civilization produces. To be sure, there is not much danger of the large proportion of our underpaid teachers over-indulging in eating or drinking, a fact perhaps overlooked by the men of science.

Sunday With My Radio

FROM Mrs. J. K. Jones, of Pennsylvania, comes an interesting letter that might be entitled, "Sunday with My Radio." It confirms my idea that radio on the farm is a wonderful companion for those who lead more or less isolated lives. It provides interest and enjoyment and prevents loneliness.

Mrs. Jones, who is evidently gifted with imagination, even seems to get an impression of travel while listening to far places. She writes, "Maybe you would be disposed to pity us on one of these wet, cold Sundays when it's too bad to take the children to church and there's hardly a chance of a neighbor dropping in to break the monotony. Before we got our radio set, we used to get lonely and feel sorry for ourselves, but now nobody minds a bit. Indeed, my husband says that a Sunday indoors gives him the most enjoyable rest he ever gets.

"The radio keeps the children contented with Sunday School, singing and bed-time stories. We all go to church in the living room and even join in the singing. Later on, my husband is apt to amuse himself by 'romping over the dial' in search of new stations. Having had our machine only a short time, he still gets excited every time he picks up another wave length.

"But the best time of all comes after the kiddies are safely in bed and we sit together 'quietly, quietly as married people do,' and listen to some lovely concert. Somehow I find my hand in John's, and everything seems so sweet and peaceful that we are surprised by the lateness of the hour. Some night we mean to sit up until we get the Pacific Coast stations. We're on our way, for we received Fort Worth, Tex., last evening."

Having Eyes We See Not

ORCHARD women are denied the stimulus of the noisy hubbub of crowds. Unless they are fortunate enough to live where the everlasting hills lift their heads to the clouds, they do not enjoy the privilege of looking at skyscrapers.

But just as interesting things happen right here in the country as in the busiest of cities. It is but a question of seeing what is going on around us. Seeing, that is, with the mind's eye, not merely with the physical organ, which may be quite perfect and yet quite blind to the significance of daily happenings.

Did you notice who won the $13,000 prize offered to the author of the best novel? It was Martha Otenso, who is described as a young teacher from "the farm lands of the Northwest." Her book, "The Passionate Pilgrim," triumphed over 1500 competitors, many of whom no doubt enjoyed what some of us consider the advantages of metropolitan life.

What Interests Everyone?

Some people enjoy engineering problems, some cookery or fashions, some politics, some music, some movies, and so on. Each one may have a particular hobby that thrills him, but when we wish to arouse universal interest, we fall back on the one thing common to all of us—human nature. Nowhere does human nature develop so individually, so startlingly one might say, as amid rural surroundings.

Out of the soil have grown subjects for literary work that has been proclaimed in all lands. From the lonely places come tales of love, sorrow, and adventure that stir the pulses. How real and full of color are the little stories that Elsie Singmaster writes of the Mennonites, the Amish, the "plain people" whose religion imposes upon them the most unworldly lives and whose aim it is to be "little and unknown, loved by God alone."

Yet, when these lives are understandingly drawn, they seem rich to us who merely read of them. It is because the writer has seen the import of things which we are disposed to think unimportant and which we must look at through the eyes of others before we can see their significance.

Right at Our Doors

In my own community, a simple fruit-growing neighborhood, there are being played, year after year, hundreds of tragic or comic dramas which, if one had but the genius to translate them into words, would, I venture to say, make a book that would wring the heart strings or rouse the mirth of a weary world.

Your own surroundings are every bit as rich in interest. There's that family to the east of you, the pathos of whose lives, properly interpreted, would bring tears to the eyes. There's that tragedy going on in the hollow behind you, which might fire the ambition of a Shakespeare. There are those newly-weds to the west, whose efforts at home-making would convulse any audience. Almost at your door, the simple nobility of some unnoticed man or woman could serve as an example to the proudest of the earth.

We Have Eyes and See Not

And in the realm of nature, how carelessly we pass along, no more aware than a blind man of the marvels that are spread before us. Our sweet, blossoming orchards hum with bees. Who took any notice of the bees beyond squealing, "Oh! for goodness sake, drive that horrid thing away; it might sting me," until Maeterlinck gave the world his "Life of the Bee."

And as if it had been waiting just for that, the world read his book. Yes, hundreds of thousands devoured it like a romance, which indeed it was. It was translated into many languages, and those of us who were caught by its charm, could never again see one of the extraordinary little creatures he had introduced to us without an impulse of wonder and admiration.

On every side crowded interest awaits the seeing eye. If all appears tame and familiar to us, it is because we have not trained ourselves to perceive the meaning hidden in familiar things. In rough translation, we have the admonition of the German poet:

Why still seek further?
Good lies so near.
Learn but to see it
Good's always right here.

What Do We Lack?

What is it that closes our minds to the beautiful, tragic, mirthful happenings so near to us? I wonder if it can be lack of sympathy. How rare sincere sympathy is. I heard the humorous account given by an invalid of the visits of so-called sympathy paid him during his convalescence from a severe operation.

Some took it for granted that he had appendicitis (because that's what *they* had) and never gave him a chance to set them straight, so busy were they telling of their own case. Some were so candidly indifferent to his sufferings that they could speak cheerily of the length of time he would likely be disabled. Before it was over, he reached the conclusion that people came to see him, not to sympathize with his woes, but to tell him about their own.

Many Are Self-Centered

It may be this sort of selfishness that blinds us to what is going on constantly about us. We're so much concerned with our own little joys and troubles that we miss much that is wonderful being enacted under our eyes. To be sure, we are alert for all the gossip of our friends and neighbors, but the deeper aspect of the great drama of life passes us by. And then we complain that our existence is dull, that nothing exciting ever happens out here in the country.

Of course, we can't all be expected to have the literary gift and ability to put what we see into compelling words, but surely we should at least be able to discover much for ourselves without waiting until someone with a heart as well as a pen puts it before us in its true light.

If we could but picture ourselves as reading the grand book of life like a glorious romance lying open before us, or as if we were seated in a theater witnessing the tenderest, cruelest, most startling scenes, we would find it is not life that has been lacking in the interest we crave, but our own blind selves.

If you have childen, one of the greatest kindnesses you can do them is to open their eyes to what they see. You cannot do this until you begin to see for yourself. I know from glad experience what large measure of joy comes in later life when one's childhood has been blessed by a mother who never let anything beautiful pass unnoticed, nor anything good go unpraised, nor anything fine miss its meed of admiration.

Robert Louis Stevenson, the sick, the suffering, the brave and joyous sojourner on this earth, was right when he said:

The world is so full of a number of things
I'm sure we should all be as happy as kings.

Most people talk much better than they write, yet there's a general craving to "get into print."

The only husband who is willing to admit that he is hen-pecked is the one who always has his own way.

It takes considerably less nerve to bear other peoples' burdens than our own.

Spray Equipment for the Home Orchard

By Guy L. Philp
University of California

MANY home orchards are more or less of a failure because the owners do not know how to control the pests or because they do not have any spray equipment. Most people think, in order to have a sprayer, it is necessary to have a large orchard with one or more power sprayers costing $500 to $1000, to control the plant pests. Fortunately our sprayer manufacturers make sprayers for the home orchardist which will effectively control the pests. The question then is, "What kind of a sprayer shall I buy?"

Probably the most important factor in determining the kind of a sprayer is number and size of trees. If you have one or two trees, a rosebush or two, the first year, you can "get by" with a hand atomizer costing 50 cents to $1.25. However, if you have several trees which are fairly large, you had better invest in a bucket pump or a knapsack sprayer, which may be obtained at a price ranging from $5 to $15, depending primarily upon the materials of construction. Generally speaking, it is not advisable to buy a cheap sprayer, as much of the material used in construction will not stand the corrosive action of many of the spray materials used. A sprayer of little higher price is made of non-corrosive materials and will long outwear the cheaper grade and at comparatively little additional cost.

The next step, if you feel a bucket pump or knapsack sprayer will not meet your needs, is the wheelbarrow sprayer. If your cultural treatments are such that it is feasible to push a 10 to 15-gallon wheelbarrow through your orchard, you will find this type very efficient. A good wheelbarrow sprayer will cost $25 to $50, and makes a very efficient outfit.

The next larger size equipment is the barrel sprayer, costing $40 to $80, depending upon the make, type, and method of mounting. A barrel sprayer will, of course, necessitate the use of a horse to pull it through your orchard. Generally, if you have sufficient trees to warrant a barrel sprayer, you will either have to have a horse or be so situated that you may obtain the use of one. If a barrel sprayer does not meet your needs, you are out of the home orchard class and need commercial orchard spray equipment. As a matter of fact, the barrel sprayer has its place in the young commercial orchard.

It may be well to add that spray equipment for the home orchard may also be used for disinfecting the chicken house, whitewashing fences, buildings, and cellars, as well as for spraying fruit trees.

AS A RESULT of the investigation of walnut grading in California recently completed by the Federal Bureau of Agricultural Economics, it is expected that walnut grades will be recommended for the 1925 crop. J. W. Park made the studies in co-operation with the California State Department of Agriculture and the California Walnut Growers' Exchange.

President Charles A. Park, of the Oregon State Horticultural Board, also is co-operating with the Federal bureau to determine whether or not the grades to be recommended for the California crop will be suitable for the Oregon crop.

AMERICAN FRUIT GROWER MAGAZINE: Enclosed please find personal check for a three years' subscription for the list of fruit growers enclosed. Some of them are already getting the magazine. Credit these with a three years' subscription in advance.

I took these subscriptions at the . . . show last week. I am encouraging the use of your good magazine. I believe the article by W. S. Perrine in the December issue on "Pruning the Peach Tree" is worth $100 to every peach grower in the Middle West.—*From an Extension Worker.*

CHATS WITH FRUIT GROWER'S WIFE

By HAZEL BURSELL

Secrets of Cake Baking

SUCCESS in cake baking depends not so much on the recipe used as on the skill of the baker. Most recipes obtained from a reliable source—standard cookbooks, newspapers, magazines, and bulletins—will give good results. They vary as to richness, flavor, and color, but the basic proportions of sugar, flour, milk, eggs, and baking powder remain fairly constant, with the possible exception of eggs. The important thing is to be familiar with the recipe and the proper methods.

The first step in cake baking is to assemble all your utensils and materials. You will actually save time if you arrange them conveniently at hand before you start baking. Then, too, it does not improve the batter to let it stand while you hunt something. Set out each ingredient called for in the recipe.

Necessary Equipment

The necessary utensils consist of two or more teaspoons, a tablespoon, mixing spoon, knife, mixing bowl, egg beater, bowl for egg whites, cake pans, and measuring cup. It would be convenient to have two measuring cups, one for liquids and one for dry measures; otherwise you will have to measure dry ingredients first. Use the standard glass, half-pint, graduated measuring cup as that is the size indicated in the recipe. You will be able to obtain accurate measures for fractions of a cup by its use. A spatula (a long, limber, wide-bladed knife) will be found invaluable for loosening the cake from the pan.

Look over your recipe and if any of the ingredients take time for preparation, take care of these at once, or in the case of especially long processes, start them even before assembling materials. For instance, I make what is called a Potato Cake. I always start the potatoes cooking the first thing so there will be no delay later. Nuts also take time to prepare. In making fruit cakes, most of your time will be spent in cutting up citron, raisins, figs, candied fruits, nuts, etc. It took me about three hours to prepare the fruits and nuts for a large fruit cake that I baked this fall.

Measuring Important

Measuring ingredients is an important process, for much of your success in cake baking depends on accurate measurement. First measure the butter—16 level tablespoonfuls equal one cup, if you prefer to measure it that way, and I believe it is most convenient. If the recipe calls for chocolate, it is best to reserve one tablespoonful of butter to melt with it to prevent too rapid hardening of the chocolate.

Now measure the sugar, filling the glass with leveled tablespoonfuls of this ingredient rather than dipping the glass in the sugar. Cream butter and sugar together in mixing bowl until of an even consistency. The butter may be warmed slightly to hasten the creaming process without detriment to the cake.

Break the eggs, separating the whites from the yolks. Drop the yolks into the butter-sugar mixture and beat vigorously for three minutes. Put the whites into the whipping bowl and set aside for the time being.

Now sift the flour from three to five times, depending on the type of cake. Flour for angel cakes is sifted five times. Flour for the rich, dark cakes does not need so much sifting. Measure the flour *after* the first sifting to insure accurate measure. Pile the flour into the cup lightly with a spoon and level with a knife. Too much flour will cause the cake to crack in baking and too little will cause it to fall. Add the baking powder just before the final sifting into the batter.

Use Pastry Flour

Never use hard wheat or "bread flour" for pastry of this kind. You will get best results by using a prepared pastry flour for all light-colored cakes, and even for some dark ones. Lacking pastry flour, use a soft wheat flour. This latter can be improved by substituting one tablespoonful of cornstarch for a tablespoonful of the flour.

It is well at this stage to get the cake pans ready. Loose-bottomed pans or pans with the patent "turn-around" will be found a great convenience when it comes to removing the cake from the pan after baking. Special pans can be purchased for special types of cakes. For instance, they have aluminum angel cake pans with legs on the top to hold them up when inverted, and also with the center "hole" attached to a loose bottom. Angel cake pans should never be greased and should never be used for anything else.

The pans for ordinary butter cakes should be oiled lightly, with some fat other than butter as butter scorches too easily. Then they should be dusted with flour. For rich dark cakes and fruit cakes where there is danger of burning during the long baking, the pan should be greased and then lined smoothly with wax paper.

If the cake calls for chocolate, it may be put on to melt, together with the tablespoonful of butter, at this stage. The chocolate may be melted in a cup set in a pan of hot water. It is well not to use a deep receptacle for melting as too much is wasted on the sides. Beat the egg whites till stiff but not dry. They will be added last of all, but we must have everything ready for mixing into the batter, as the baking powder will lose its raising power if allowed to stand after the liquid is added.

Beat But Do Not Stir

To continue with the cake mixing—measure the milk and add part of it to the batter and then sift in part of the floor and baking powder. Beat well before adding more milk and flour. Then add milk and flour alternately till all has been mixed in the batter. Beat vigorously for a minute or two. Never stir your cake around and around—beat it over and over. Stirring merely mixes the ingredients, but adds no air. The more air incorporated in the cake the lighter it will be. That is the reason for adding the beaten egg whites last.

Now add chopped nut meats (do not chop nuts too fine or they will have no flavor in the cake), spices, flavoring extracts, and fruits, according to the recipe. Remember that it takes more extract for a batter that is to be baked as some of the flavor is lost through heating. Lemon, almond and rose extracts seem appropriate for the lighter cakes, while vanilla goes best with chocolate. It takes a slightly stiffer batter to "hold up" fruits, and these should be floured after cutting. A pair of scissors is best for cutting many kinds of fruits. I try to use the moist fruits—figs, dates, candied cherries, seeded raisins, etc.—in fruit cakes, as in this way I can obtain a moister, richer cake.

Lastly, fold in the beaten egg whites,

cutting them in lightly. Lift the mixing spoon out of the batter and cut down through, over, and out again with each stroke. Add more of the whites and continue till mixed in. Stir no more than is absolutely necessary. Now pour the batter into the pan or pans, as the case may be, and it is ready for the oven.

Temperature Important

One of the big secrets of making good cake is having the oven at the right temperature for the particular type of cake. You are fortunate if you have a reliable oven thermometer and can regulate the oven to just the right temperature, but most farm women do not have that convenience. Practically all recipes give the correct oven temperature and the length of time best for that particular cake.

In general, layer cakes take from 20 to 30 minutes to bake in a fairly hot oven. They should have a chance to raise evenly before the top crust sets. The heat may be increased slightly after the cake has raised evenly. Sponge cakes take from 45 to 60 minutes in a very moderate oven. Angel cakes take from one to one and one-half hours, the longer the better so long as they do not scorch. The oven is started cold and gradually heated to obtain the best results with angel cakes. Most loaf cakes require 40 to 60 minutes in a moderate oven, slow at first and hotter towards the last. A pound cake requires one and one-fourth to one and one-half hours in a moderate oven. A large fruit cake should be baked two and one-half to three hours in a very slow oven; or better still, steam for two hours and bake for one hour. If cooked by the long baking process alone, the cake should be covered with wax paper towards the last.

To determine whether or not the cake is done, insert a clean straw or toothpick in the center. If the straw comes out clean of dough, the cake is done. An angel cake will start drawing away from the sides of the pan when it is done, and if properly baked it will be a lovely golden brown in color.

To Prevent Sticking

When the cake is done, remove to a board on which powdered sugar has been sprinkled. The sugar will keep it from sticking and will not alter the frosting in any way. Several thicknesses of wax paper will be best for a fruit cake. If the cake shows a tendency to stick in the pan even after a knife has been run around the edges, let it stand for a few minutes to steam. Here's where the loose-bottomed pan comes into its own! An angel cake really should stand till it comes free of its own accord. Some women prefer to ice their cakes before they are entirely cold; others like them cold.

It is difficult to give general instructions for cake making. Each cake presents its own problems and difficulties. I have given the general method for all butter cakes in this article, together with some instructions for special types of cakes. Some day we will have an article devoted to the making of angel cakes and nothing else.

Pineapple Recipes

PINEAPPLE never ceases to be a treat no matter how often or in what form it is served. It will give zest and flavor to almost any salad or pudding and lends itself to the simplest dish as readily as to the rich, fancy dessert. It is delicious when eaten plain as a sauce with bread and butter or cookies. It is true that pineapple is fairly expensive, but it is easily within the means of the average family occasionally. Pineapple salads are always easily made and most delicious. Keep a few cans in the pantry for special occasions or the unexpected guest.

Pineapple Salad

For each service use 1 slice pineapple and 1 T. freshly grated cheese. Serve on a lettuce leaf or bed of water cress. Serve either with or without French dressing. Cottage cheese will be equally good with pineapple.

Pineapple Snowballs

½ c. pineapple, grated	¾ T. lemon juice
⅔ c. cold boiled rice	⅓ c. cold water
⅔ c. pineapple juice	½ c. sugar
	½ T. gelatin

Soak gelatin in cold water and dissolve over hot water. Dissolve sugar in fruit juices and add to the gelatin mixture. Add rice and mould. Garnish with whipped cream for each serving if a richer dessert is desired. This recipe serves five persons.

Pineapple Sherbet

1 qt. sugar	4 lemons
1 qt. water	3 egg whites
1 can grated pineapple	

Boil sugar and water to a syrup and pour boiling hot over grated pineapple, add juice and pulp of lemons, put in freezer and add beaten egg whites. Fill with cold water lacking one quart. Turn freezer until full. This recipe makes one gallon.

Pineapple Pie

2 T. flour	Juice ⅓ can pineapple
½ c. sugar	1 t. butter
2 eggs	2 slices pineapple
1 c. hot water	

Mix flour, sugar, beaten egg yolks and pineapple juice. Add hot water and butter and cook in double boiler until thick. When cool add pineapple which has been ground in meat grinder or finely chopped. Fill a baked crust and top with meringue made from 2 egg whites, beaten and sweetened with 2 T. sugar. Brown the meringue in slow oven.

Pineapple Cabbage Salad

Mix equal parts of crisp, shredded cabbage and grated pineapple. Moisten with boiled or French dressing and serve on a bed of lettuce with a red cherry for garnish.

Fruit Salad

1 orange	1 can pineapple
2 bananas	⅓ c. skinned grapes
½ c. walnuts	¼ c. raisins
½ c. apple	2 T. finely cut celery

Prepare and mix ingredients, taking care not to stir too much. Sweeten to taste. Serve with sweetened whipped cream or a sweet boiled dressing.

Pineapple Cream Custard

Beat the yolks of 3 eggs slightly, add ⅓ c. sugar, ⅛ t. salt and 2 c. hot milk (not boiling). Cook in top of double boiler until thickened, stirring constantly, and cool. Beat 3 egg whites stiff and add 3 T. powdered sugar. Add ¾ c. grated pineapple to the cold custard and fold in one-half of the egg white mixture. Pour into serving dish and spread remainder of whites on top. The meringue may be browned in a slow oven if preferred.

Pineapple Sandwiches

Cut oblong slices of sponge cake about ½ inch thick. Put together in pairs with a layer of grated pineapple between. Place on individual serving dishes, sprinkle with powdered sugar and stick halves of blanched almonds into the top layer of cake. Pour cold custard sauce over just before serving.

Pineapple Baked Apples

Wash and core 6 apples. Fill centers with grated pineapple. Place in baking dish and pour ½ inch of water in pan. Add ½ c. sugar and 12 old-fashioned cinnamon drops to the water. Bake in slow oven until apples are tender, adding more water if necessary and basting frequently with the syrup. Just before serving, heap the centers with additional pineapple.

Pineapple Bread Pudding

Add 2 c. hot milk to 2 c. stale bread crumbs and allow to stand until cool. Beat 2 eggs, and add ½ c. sugar, ⅛ t. salt and ¾ c. well-drained grated pineapple. Combine the mixtures and pour into a greased baking dish. Bake in slow oven until firm, or about 35 minutes. Serve with a sauce made from syrup of pineapple thickened with cornstarch.

Pineapple-Cucumber Salad

Thoroughly drain 1 c. crushed pineapple. Mix with 1 c. finely diced cucumber and add boiled dressing or mayonnaise to moisten well. Arrange on lettuce and garnish with strips of red pimento.

Cantaloupe Fruit Cup

Cut small cantaloupes in halves crosswise and discard seeds. Scoop out the pulp, cutting it in small pieces, and mix with an equal quantity of grated pineapple. Chill thoroughly, refill the cantaloupe shells and serve on individual plates.

Imperial Salad

Dissolve a package of lemon Jell-O in a pint of boiling water. Just as Jell-O begins to set, add one small can sliced pineapple, one-half can Spanish pimentos, shredded, and one sliced cucumber. Serve with cream or boiled dressing.

Pineapple-Strawberry Cocktail

Cut large, fresh, hulled strawberries in halves, reserving enough whole ones to garnish. Put cut berries in cocktail glasses and sprinkle with powdered sugar. Add grated pineapple to fill glasses and top each with a whole berry. Chill thoroughly before serving.

Table of Equivalents

1 c. equals 1 cupful.
1 t. equals 1 teaspoonful.
1 T. equals 1 tablespoonful.
1 pt. equals 1 pint or 2 cups.
1 qt. equals 1 quart or 2 pints.
1 lb. equals 1 pound.
All measures are level.

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The Most Used Room

By Ruth Gordon McCarron

A LIVING room should be what its name implies; a room to live in, a room in which the members of the family can feel at home, and a room for companionship and rest, where friends are made happy. If this room is furnished with much pretention it may overstep the mark and be stiff, while another done with great simplicity may achieve the charm whose secret is "at-homeness." A successful living room is not necessarily an expensively furnished room.

A living room should be decorated and furnished with three rules in mind—it should be comfortable; the furnishings should be arranged conveniently; and everything in it should be usable, that is, each piece should serve a purpose and should be sturdy enough to withstand "day in and day out" wear.

No room can be beautiful without a proper background. The ceiling; the walls, with doors and windows, shelves, built-in furniture, and fireplaces; and the floor form the background against which, if these surfaces are treated in a becoming neutral color, you, your clothes and your furnishings will show to the best advantage.

The choice of color for the background of the living room is rather limited. Because the atmosphere of this room, if the true spirit is achieved, must adapt itself to many personalities, a neutral tint for the walls is advisable. In the selection of the color scheme, two considerations arise, the exposure of the room and its size.

Colors Affect Light and Size

The walls of a room with northern or eastern exposure require warm tones—cream, putty, tan. Additional warmth may be gained by carefully selected colors in the furnishings. In rooms with southern or western exposure, although warm tints may be used, grays, from the cool pale gray to the soft mouse-color, are better. A neutral tint that blends with the general color scheme, if a room is being done over, must be the one selected.

The size of the room is the next consideration. Colorists tell us that yellow, red, and orange, are "advancing colors." They make a room appear smaller. On the other hand, the "receding colors," blue, green, and gray, apparently enlarge the size of a room. Paneling the walls is a very effective method of altering the size or shape of a room. If the plaster walls and ceilings are old and cracked, panels of wallboard may be applied and painted in the chosen color.

An interesting moulding treatment may be worked out between the sections of wallboard, matching the wood trim. Without the use of moulding, painted walls offer many possibilities in paneling. Painted panels may be developed directly on the plaster wall in plain, two-toned, or mottled finish, or by the use of the new lace stencils, while the field, or wall surface outside of the panels, may be painted in a lighter tone of the paneling, or in contrasting color.

Unusual Finishes

Walls are frequently finished in stippled effect. Stippling is produced simply by patting the paint before it has set with a stiff brush (a "stippling brush").

If you prefer figured finishes, delightful effects in two tones may be produced at little if any more cost than one tone painting. One method is to apply a ground coat of one color and when it is dry, to apply a harmonious tint. While this latter is still wet the surface is patted with a wad of cloth, paper, or a sponge, lifting some of the upper coat. A newspaper, crumpled lengthwise, and rolled over and over down the wall, will produce a mottled effect distinctly different from the cloth or sponge method.

Color misting is a new system of decoration that possesses many interesting possibilities. This work is a combination of two, three, or more colors "misted" with an "air brush" or spattered on a solid background.

Where walls are badly cracked or chipped, these finishes, apart from their beauty, have the added advantage of hiding defects.

The walls of the living room will look well if painted in figured effects, but, considering the general nature of this room, the plain-toned wall is safer. Briefly, the walls of the living room will be most successful if they are not too light, or too dark, or too severe, or too gay.

The Importance of Woodwork

The color treatment of the woodwork cannot be decided upon until the wall color has been definitely determined, since the two go hand-in-hand to form the background. So many people have found out for themselves the decorative value of painted woodwork, toning with the walls, that arguments in its favor have become unnecessary. Since pure white is, at times, a trifle harsh, the most successful rooms are those with woodwork of ivory or cream. Finishing the trim the exact color of pale walls is a new idea which is very beautiful.

Many beautiful effects on woodwork can be obtained by painting or staining the wood in a decorative color, such as smoke gray, peacock blue, or olive green. A coat of varnish will preserve this finish.

If your living room is large and the woodwork good from an architectural standpoint, it may be found desirable to stain and varnish the woodwork. Varnishing brings out the "sleeping beauty" of wood.

The floor of the living room is as much a part of the background as the walls are and it should be definitely related to them. A pale ceiling, deeper-toned walls and a dark floor, which should always be the heaviest note of the background, should all be part of a continuous, harmonious whole.

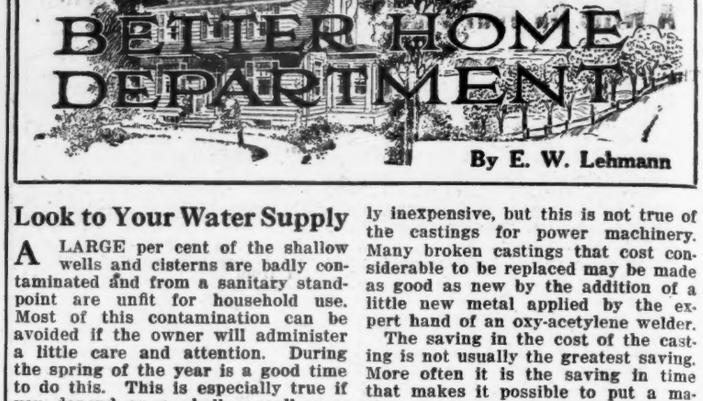
The floor should be stained and varnished. This is the most satisfactory finish. A mop slides easily and quickly over such a surface and at intervals it may be washed with cold water without impairing its lustre.

A very lovely room may be developed from a dark brown floor, with walls finished with flat paint in a cool putty tone, and an ivory or cream ceiling.

If the trim is painted ivory with a gloss or semi-gloss enamel, this neutral background will have in it the capacity for being rose, green or blue, according to the predominant color chosen for the furnishings.

THE FEDERAL grades for fruits and vegetables are meeting the needs of producers, consumers and dealers if requests for additional work along grading lines are an indicator of the popularity of these standards. Recently requests have been received for the establishment of grades for dried apples and dried prunes. Assistance has also been requested in establishing grades for fruits and vegetables handled between growers and canneries. Work along the latter line was inaugurated recently when grades were recommended for cannery tomatoes. The state of Oregon is particularly interested in having federal standards established for additional products in that state, and is particularly desirous of having grades established for berries.

INVESTIGATORS who have been experimenting with brown rot of peaches in Georgia have reached the conclusion that the control of curculio means practically the control of brown rot also. Dr. H. W. Anderson, who has been working on brown rot in Illinois, has come to the same conclusion. It appears that the principal method of infection by the brown rot fungus is through wounds made by curculios.



By E. W. Lehmann

Look to Your Water Supply

A LARGE per cent of the shallow wells and cisterns are badly contaminated and from a sanitary standpoint are unfit for household use. Most of this contamination can be avoided if the owner will administer a little care and attention. During the spring of the year is a good time to do this. This is especially true if you depend on a shallow well or a cistern for your drinking water supply.

A large part of all contamination that enters wells and cisterns gets in with surface drainage at the top or passes directly through the top. The danger of underground contamination is slight in comparison with this danger. A prominent sanitary engineer stated that 90 per cent of all contamination gained entrance within a radius of four feet of the top. If this is correct, and I believe it is, every owner of a shallow well or cistern might well look to the top, and to surface drainage.

Make Curbing and Top Tight

The following points might well be kept in mind in making a shallow well or a cistern safe for drinking purposes. Make the wall of the well or the curbing water tight and extend it at least one foot above the surface of the ground. Construct it so no water can pass into the well without percolating through at least eight to 12 feet of soil. A layer of tight clay thoroughly compacted around the curb will make it water tight.

Water tight material for the top is essential. Construct it so that water that has been pumped out will have no chance to flow back into the well again. To make this possible, extend the top over the opening, provide a raised place for the pump, and see that the top slopes so that the water will be carried away.

Concrete is about the best material for the construction of a well or cistern top. If wood is used, make it of tongue and grooved material and of double thickness. Avoid cracks and arrange the top so that no one will stand on it if there is danger of filth from the shoes gaining entrance.

Be Careful in Collecting Cistern Water

For the cistern owner the collection of the supply is all important; in fact, most of the impurities that get into a cistern supply are washed in from the roof—this includes dust, dead insects, bird droppings, etc. Always allow the first rain to thoroughly wash the roof before collecting a supply if it is to be used for drinking purposes. If a filter is depended on, don't neglect it. See that it is cleaned out at regular intervals, and that the materials in it are renewed.

The fact that our water supply plays as important a part in our health as the food we eat and the air we breathe, we cannot afford to neglect it. There is much sickness and many deaths each year due to contaminated water supplies. For this reason every effort should be exerted to make the supply pure and wholesome.

Making Emergency Repairs

THE OXY-ACETYLENE blowpipe in the hands of a competent operator has come to the rescue in making many emergency repairs on farm machinery and has meant a great saving of time and money during the busy season on many farms. Most castings on farm implements are relatively inexpensive, but this is not true of the castings for power machinery. Many broken castings that cost considerable to be replaced may be made as good as new by the addition of a little new metal applied by the expert hand of an oxy-acetylene welder.

The saving in the cost of the casting is not usually the greatest saving. More often it is the saving in time that makes it possible to put a machine back into the service almost immediately that is the big thing for the busy farmer. Loss of time due to delays when something breaks on the sprayer or the tractor, or on the planter or harvester, costs the fruit grower or grain farmer real money. In nearly every town a welder can be found who can make repairs in short order.

Unlike the blacksmith of former days, the expert welder can handle different metals with equal ease, also large as well as small castings. The cracked cylinder block or a small broken sprocket can be made practically as good as new. Parts may be cut away or renewed. In fact, with the tools for cold metal working and the help of an oxy-acetylene welder, there is little work today for the old-fashioned blacksmith in the repair of farm machinery.

Watch Your Lubrication

IT HAS been estimated that at least one-half of all machinery operating troubles are due to improper or lack of sufficient lubrication. Procrastination in the matter of lubricating the important machines like the tractor and gas engine is certainly the thief that steals these machines for the junk man. Men who have given their car careful attention and who have noted its performance realize the importance of proper lubrication.

Only the very best grades of lubricants should be used. It does not pay to use cheap oils on high-priced machines, it is expensive economy every time. If you operate a car or a tractor, use the grade of oil recommended by the manufacturer of the machine. It is always safer to buy a known brand of oil at a higher price from a reliable company than to buy a cheap brand without a name back of it.

It is more important to watch your oil than it is the fuel supply. When a tractor stops on account of an empty fuel tank no harm is done, but when it stops due to inadequate oil the damage may be beyond repair. Make it a rule to check the oil each time the machine is started and many of the operating troubles will be eliminated.

It is well to be guided by the oil chart furnished with your tractor. Don't neglect the oil and let the tractor run five days without changing the oil just because your neighbor does, when the chart says change for each 30 hours of running. It might be that he does not actually operate the machine as many hours in five days as you do in three.

A LETTER from W. S. Perrine, Centralia, Ill., states that the cold weather at Christmas time destroyed practically all the peach buds in south central Illinois and about 50 per cent of the buds in extreme southern Illinois. Since 50 per cent of live buds will permit the production of a good crop, there is still a chance that a fairly good peach crop will be produced in the southern part of the state.

Origin of Some of Our Leading Varieties of Peaches

By Helen R. Pearson

SAMUEL H. RUMPH was the pioneer peach grower of Georgia. When he started his orchard at Marshallville none of the standard varieties now grown were in existence. In fact, there were no commercial orchards in Georgia at that time. He ordered a few trees of each variety he could get from northern nurseries and planted them in his orchard. He brought them into bearing, and shipped them to New York, by rail to Savannah, and by boat from there to New York in refrigerator boxes that he built himself. These were returned to him to be used again and again.

He was continually on the alert to produce new varieties that would be more suitable to Georgia conditions, and he planted seeds from his most desirable trees. At one time he found an Early Crawford tree that had desirable fruit and he gathered all the seeds, planting half of them himself and giving the other half to his half-brother, Lewis Rumph. Samuel Rumph obtained a new variety from one of these seeds, and called it the "Elberta," in honor of his wife, and his brother from one of his seeds produced the Belle of Georgia. It is an interesting fact that both of these widely different varieties originated from the same parent tree. On one side of this Crawford tree stood an Old Mixon and on the other side a Chinese Cling. It is thought that the Belle of Georgia is a cross between the Crawford and the Old Mixon and the Elberta between the Crawford and the Chinese Cling. The Elberta soon took its place as the leading commercial peach of the country, and it still holds its lead in this respect.

Several years later Anse Slappey originated two varieties of yellow fruit, calling them "Bull of the Woods" and "Hellbumper," but the latter variety was renamed the "Slappey" by the American Pomological Society. This variety is still grown to some extent but does not always carry to the market in good condition.

The "Hiley" variety came from a seedling tree in Mr. Hiley's grove at Fort Valley and has become one of the important commercial varieties. The Carman variety was originated in Texas and is named for Mr. Carman, the editor of the *Rural New Yorker*. This variety also has played a very important part in the development of the Georgia peach industry.

Mr. Rumph's success in propagating and raising Elberta and Belle of Georgia peaches created interest in Georgia peaches all over the country, and J. H. Hale, seeing his success, started the famous Hale-Georgia orchard at Fort Valley, and the J. H. Hale variety was named for him.

From that time on the peach industry has grown in Georgia very rapidly. On the whole it has been successful, but the growers have worked under many difficulties. From 1901 to 1908 brown rot and the peach curculio seriously threatened the entire peach industry in Georgia. In 1908 a remedy was found for these troubles in the self-boiled lime-sulphur spray for brown rot, to which arsenate of lead was added for the curculio, and this stopped the trouble for several years. During the last seven years, however, these enemies have become serious again and the growers have had a great deal of trouble in producing their crop.

One thing is in their favor. They are rarely hurt by cold weather, and no crop has been entirely destroyed by a freeze since 1899. The Georgia peach section, particularly around Fort Valley, can be depended on to produce a good crop every year.

AMERICAN FRUIT GROWER MAGAZINE: I want to say that your magazine is the best I have ever read, barring none. I have only been a subscriber three months. I wish I had known of this magazine years ago. Look what I have missed!—*J. M. Ratliff, Arkansas.*

The Greatest Convenience in Our Home

By Ruth Valerie

This Story Won Second Prize in Our Prize Contest

JUST 18 years ago on a very cold day in February a small cavalcade consisting of two men, a woman and a horse and wagon could be seen making its slow way through the drifts of snow, its destination a lonely island. The only building in sight was a barn; at this the horses were stopped, the household goods were unloaded, the man and wagon disappeared into the distance, and man and wife were left to take up to what was to be to the city-bred woman an entirely new life.

The barn was new, having been built the year before, and the lumber had shrunk, having wide spaces through which the north wind whistled and blew great flakes of snow. The river and lake were frozen solid, and except for an acre or two of cleared land, the surrounding woods were dark and silent.

Visions of the Future

To many the outlook might have seemed dreary and depressing; but the man already visioned fields of waving grain and vines heavy with fruit. Where now was forest he saw orchards pink and fragrant with blossom. Working four miles away at a night job gave him the necessary money to carry on, and left the day free to clear land. With a will he set to work to make his dreams come true.

At the end of that summer, by dint of hard work in what should have been sleeping hours, a house was built. But that winter proved to be the coldest in 20 years. Daylight could be seen through the lathed walls through which the bitter wind found its way. The cold was intense. Often there was a scum of ice on the milk before the meal was over. Ice would form on the blankets before morning. A hole had to be chopped in the ice with an axe, and water was carried up a steep bank to the house. At last a pump was installed in the kitchen, which proved a wonderful boon—when it wasn't frozen.

Clearing the Land

During the long hard years that followed, years of strenuous effort and of dogged determination, difficulties that seemed well-nigh insurmountable were overcome. The man was able to give up the night work and devote his whole time to the farm.

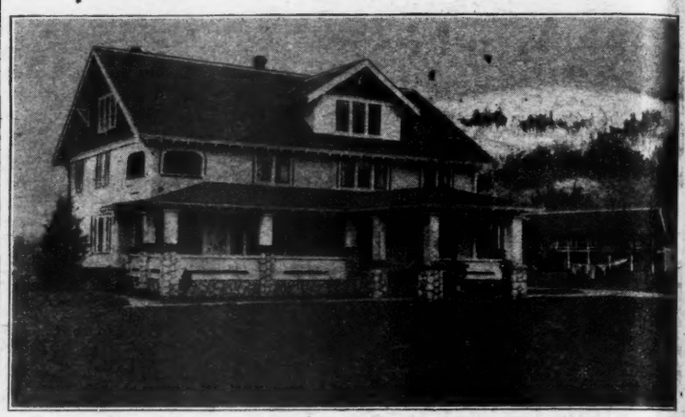
Acre after acre was cleared. Valuable land was reclaimed by a dyke, which, although bitterly opposed, was at last built. More land was planted out every year into fruit, until more than 100 acres were in full bearing.

Until then all improvements made had been upon the farm. Comfortable pickers' quarters and cafeteria for their convenience were built with fireplace, together with a hall to dance and play in and moving pictures for their entertainment.

Improvement of the House

At last it seemed an improvement in the home was justified. It was decided to build over the old house. A new wing was added and a new roof was built entirely over the top of the other. When this was done, a water system was installed—the great longing and dream of the busy housewife at last being realized. An electric pump was placed in the basement. This worked automatically, stopping

(*Concluded on page 41*)



A view of the house that we waited for. The pickers' cafeteria is shown in the background

Picking strawberries on land formerly occupied by a lake, now reclaimed by a dyke

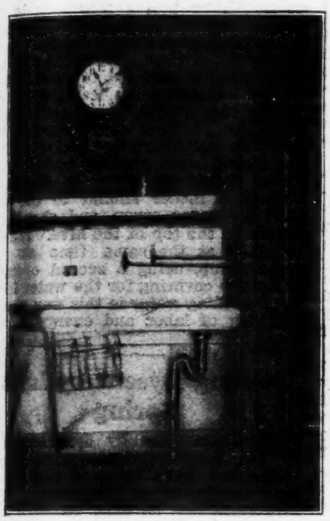
Our Greatest Convenience

By Mrs. Alice J. Morrill

This Story Won Third Prize in Our Prize Contest

WE LIVE in one of the most beautiful spots in New Hampshire, high up on the Catamount, three and one-half miles from the village of Pittsfield. We have a cozy little home, equipped with many modern conveniences. But if it were not for our splendid water system, we would not now be enjoying the comforts afforded by our convenient little bathroom. Neither would we have hot and cold water in our kitchen sink.

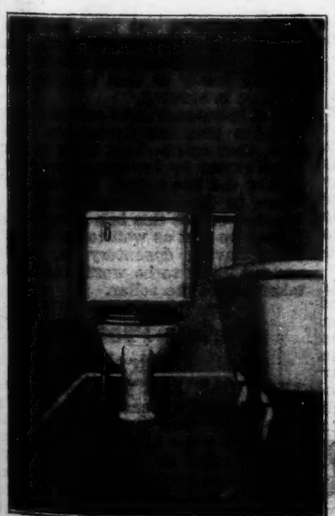
There was a time, not so many years ago, when all the water used in our house and barn had to be drawn from the well in buckets, not the pic-



Running hot and cold water in the kitchen is one of the greatest conveniences on the farm

turesque open buckets, but pails suspended by a rope and lifted by main force from the depths of the well. In times of drought, this well would go dry and water for the stock had to be hauled from a spring way up on the mountains. It was a hard, laborious task.

After a few such experiences, we were forced to the conclusion that something must be done and done quickly. So we called on a neighbor, who was the owner of a very fine water system, and asked him to help us. Holding a branch in his hands, he led the way up the mountain-side. When about 800 feet from the house, the branch began to twist in his hands. "Right here," said the man, "you will find an abundance of water." Without saying whether or not we believe in water witching, we were content to have the well anywhere, and we therefore started digging where the man had indicated.



Bathroom conveniences made possible by a good water system

It took weeks to dig the well, which is 18 feet in diameter. Dynamite was used in large quantities to remove the great masses of stone. But at last it was finished. What joy to see the great hole fill with sweet spring water—a seemingly endless supply fed by unseen springs.

But the digging of the well was only a part of the work. It took lots of grit to dig a trench five feet deep and 800 feet long. In this trench was laid one and one-fourth inch galvanized pipe of the best grade to lead the water to the house and barn. Since the well is on a higher elevation than the house, we need no pumping system, but get plenty of pressure through gravity. In fact, the pressure will throw a stream over the chimney, which would be a valuable feature in case of fire.

We were certainly gratified when the hard, grinding labor was completed. No one can realize the joy we felt when the faucets were in place and the water came gushing forth.

Many years have passed and we have had seasons of drought, but we have always had an unfailing supply of water.

The Greatest Convenience in Our Home

(*Continued from page* 40)

when the tank was full. It not only supplied the whole house with unlimited hot and cold water, but supplied also the cafeteria, laundry room, and spray baths for the pickers.

Oh! the relief to no longer have the back-breaking job of pumping water for all the needs of a large household. To have a really truly enamel bathtub, and water in all the bedrooms, to no longer have to keep the family clean in the wash tub—only those who have known the difficulties can realize the joy of it. Of all the many improvements that have been made both inside and out of the house, none can compare for convenience with modern plumbing arrangements.

Sleeping Porch a Great Convenience

There is one other improvement in the new home I would like to mention, which would, I believe, outweigh in value almost everything else. This is the sleeping porch. It has given pure joy and pleasure from a spiritual and mental standpoint, as well as being most healthful. Built on the west side of the house and overlooking the lake, the scenery at all times is very restful and beautiful. After the heat and worry of the day to be able to lie and watch the quiet heavens with its myriads of stars, the moon, cold and remote, throwing a silvery pathway of light over the softly rippling lake, the distant mountains outlined against a velvet sky, is balm to the weary spirit. It is a spiritual uplift. One feels with the grand old psalmist of old "I will lift up mine eyes unto the hills, from whence cometh my Help."

Standard Containers for Fruits and Vegetables

A RECENT bulletin, Farmers' Bulletin No. 1196, on "Standard Containers for Fruits and Vegetables," has been issued from Washington, D. C. This is a very timely publication and one that every farmer who is growing fruits or vegetables should have at hand. It contains descriptions and pictures of all of the accepted containers of various sorts. Now that the government is passing laws regulating the sizes, shapes and the like of containers, every shipper should be familiar with them, otherwise there might be trouble arising through using an improper or illegal container. We suggest that our growers all send to the Department of Agriculture, Washington, D. C., for a copy of this bulletin.

Bee Keeping for Fruit Growers

By H. F. Wilson

Use Care in Spraying to Prevent Poisoning of Bees

POISONING of bees by spray material seems to be a serious problem in a number of fruit growing sections and has caused serious losses to both beekeepers and orchardists. About a year ago we called attention to this fact in these columns and tried to impress upon orchardists the value of arranging a schedule that would avoid the application of spray while the trees were in full bloom. This matter is more important to the orchardist than to the beekeeper because of the part that bees and other pollen distributing insects play in the cross-pollination of fruits.

There is no definite way of estimating the value of bees in cross-pollination, but it is a known fact that orchardists in the state of Washington have been willing to pay as much as $5 per colony for renting bees during the blooming period. It is also known that some fruits are self-sterile and that cross-pollination is absolutely necessary in order to secure a set of fruit.

In the great majority of cases it has been shown that it is not necessary to spray trees while in full bloom, and that it is better to spray before the buds open fully and just after the petals have fallen. In the case of apples it is quite important in controlling the codling moth to spray as soon as most of the petals have fallen in order to get some poison into the calyx cups before growth of the fruit closes them. In the case of pears, it does not seem to make much difference, as the calyx cup does not close and poison can be gotten into the cup at almost any time.

It is a practice among some growers, because of large acreage, to start spraying while the trees are still in bloom, with the expectation that the petals will have fallen over the major part of the orchard before the trees can be reached and that it is necessary to start early in order to properly spray the last portion of the orchard. This may be the case in rare instances, but I believe that with a little extra planning and some extra labor for a day or two, this can be prevented, and that the return in fruit, by permitting insects full opportunity for bringing about cross-pollinization, will make up the difference in cost. In seasons when the early blossoms are destroyed or injured by spring frosts, saving the late blossoms is an item of real importance.

Feeding Bees This Spring

DON'T forget to look through your colonies at the first opportunity, and be prepared to feed each colony some sugar syrup. Keep the colony abundantly supplied with stores until the spring nectar can be secured in the field. Bees never waste extra stores, and stores are absolutely necessary for the colony to rear brood.

In preparing the sugar syrup, mix two pounds of sugar to one pound of water and heat until the solution starts to boil. Then turn off the fire and add a tablespoonful of tartaric acid for every five gallons of sugar syrup. If the syrup can be fed lukewarm, the bees will take it down much better. The best type of feeder to use is a 10-pound pail with a few holes punched in the top of the cover. This should be used on top of the hive. If bee escape boards are available, set the pail over the hole in the board. If not, place several thicknesses of newspaper over the frames, making a hole just large enough so that the bees can get to the feeder. Place an empty hive body above the hive, and a cover on this.

It is also important that combs containing pollen be placed in the hive as quantities of pollen are necessary in the spring, and if it is placed in the hive it will save the bees the labor of bringing it in from the field. If bees do not have pollen stores in abundance, they are quite likely to curtail brood rearing and may check it completely for a time. Water is also an important requirement of bees in the spring. Experiments carried on at the University of Wisconsin show that a colony of bees may consume as much as six gallons of water during the spring brood rearing period. The water should be given to the bees through a feeder similar to the one used for sugar syrup, and should be placed on the top of the hive. It may be given at the same time as the sugar syrup, using a second opening in the top covering for the water feeder. Providing water in this way means a saving of labor and energy to the bees.

Treating Dysentery in the Spring

LOSSES of bees by dysentery is a troublesome situation which many beekeepers have to face every season, and the great difficulty is that very little can be done to save the bees after they have been put into winter quarters and the dysentery gets a start.

The best way to prevent dysentery is to see that the bees have good stores in the fall. In some sections dysentery seldom, if ever, occurs, while in other regions it is quite common. In those sections where dysentery occurs frequently, every beekeeper should make it a point to feed each colony of bees from 10 to 15 pounds of sugar syrup, which the bees will place in the combs below the honey, and this will be the food which they will use during the winter.

After dysentery is once started in a colony, the only thing a beekeeper can do is to look forward to an opportunity to set the bees out at the earliest date upon which they can have a flight. There is not much reason to set bees out for a chance flight while there is snow on the ground. After the snow is off the ground in the spring it is worth while to set bees out on any day when the temperature in the shade is above 45 degrees Fahrenheit as bees can fly freely at that temperature if the sun is shining.

If it is impossible to set the bees out and the bees are flying out of the hive, they can be held back to a very large extent by lowering the temperature of the bee cellar. However, there seems to be some question as to whether or not this is a good practice. It may be just as well to let those colonies having dysentery go, as they are not likely to be worth much when taken out of the cellar.

Spring Protection Desirable

YOU CAN help your bees a great deal and increase the possibilities of a honey crop many fold by giving your bees some kind of protection during early spring. The protection may be of almost any type which will prevent the wind from striking the hives and will at the same time help to hold the warmth of the hive within the brood chamber.

The Peach Situation in Georgia

By J. H. Reed

INDICATIONS are that the disastrous peach season of last year will not be repeated in 1925 but that a smaller crop will be obtained and a larger profit secured through better handling of the crop.

In the first place, it is estimated that fully 500,000 of the older peach trees have already been cut down. Most of the cutting has been done in Macon, Houston, and Peach counties with a good many trees being cut down in Jones county. This, of course, will serve to reduce the crop this year. Last season there were 8,900,000 trees in bearing, and this year it is estimated that the number of bearing trees will range from 9,000,000 to 9,300,000, according to the amount of cutting done in the older orchards.

Another factor entering into this year's peach crop is the reorganization of the peach exchange. This body has modified its rules in such a manner that growers are not compelled to sell through the peach exchange unless they wish to, and this is expected to relieve the situation as the larger growers can sell to whom they please. At any rate, if growers sell independently they cannot blame the peach exchange for their troubles this year.

A third factor which will relieve the situation in the peach belt is the formation of the Peach Credit Bank in Macon, Ga. This bank, patterned after the Intermediate Credit Banks for livestock men, will lend money for several months on the peach crop and so relieve the financial difficulties which the peach grower faces in getting his crop on the market and selling it.

A fourth factor influencing the crop is the elimination of the early varieties of peaches by most of the growers. Most of these early varieties have not proved profitable, and last season they proved to be a dead loss, most of them not even being packed.

Indications are that this year's crop will consist of the following varieties in the proportions indicated in the table:

Variety.	Per cent of crop.
Elbertas	46.3
Hileys	34.0
Belles	8.1
Carmens	7.8
Early Roses	3.6

Elbertas and Hileys have proved themselves to be the steadiest producers and the best shippers, and peach growers are turning more and more to these two varieties to the exclusion of early and late peaches.

Last but not least comes the by-product plant as a means of disposing of peaches which, for one reason or another, are not fit to go to market.

Formation of by-product plants has received the endorsement of the Georgia Peach Growers' Exchange, as well as of Atlanta and Macon bankers interested in the industry, and competent engineers are now at work making plans for a number of by-product plants to be located at central points in the peach belt of the state.

A canning plant, located at Marshallville, Ga., proved a big success during the past year, saving a good bit of money for peach producers in the section, and it is expected that most of the by-product plants will be in the nature of peach canneries, though other by-products will, of course, be manufactured.

In short, everything possible is being done to prevent a glut on the market this year, and as the crop will probably be considerably smaller than the 1924 crop, due to the usual variation in production, it is more than likely that peaches will net more profit in Georgia this year than last season.

Nebraska Horticultural Society Meeting

THE fifty-sixth annual meeting of the Nebraska State Horticultural Society was held January 6-8, 1925, at Lincoln during Organized Agriculture Week. The attendance was somewhat larger than usual, the interest was very good, and the program was superior in many respects to those of recent years.

The first half-day session was devoted to ornamental horticulture, with addresses by Prof. C. H. Diggs of the Iowa Agricultural College; Miss Edna Benson, Nebraska Agricultural College; Jacob Sass, Bennington, Nebr.; and G. A. Marshall, Arlington, Nebr.

Prof. B. S. Pickett, Iowa Agricultural College, and Prof. F. S. Merrill, Missouri Agricultural College, had for their respective subjects at the Fruit Growers' Session, "The General Outlook for Fruit Growing, Especially Apples in the Missouri Valley Region," and "Pruning as a Factor in Apple Production."

One session was devoted to a discussion of orchard fertilizers, papers being given by Prof. Pickett, Prof. J. C. Russell, Nebraska Agricultural College, and Frank Shubert, a practical grower from Shubert, Nebr.

The last half day was devoted largely to the question of methods of packing and type of package to be used. Prof. Merrill of Missouri, Prof. C. C. Wiggans and F. M. Coe, Nebraska Agricultural College, and Mr. Chisam, Omaha representative of the Federated Fruit & Vegetable Growers, Inc., were the speakers.

Officers elected to serve for the ensuing year are as follows: President, W. B. Banning, Union; first vice president, C. R. Green, Fremont; second vice-president, J. R. Davidson, Aurora; treasurer, Frank Shubert, Shubert; and director, Grove Porter, Nebraska City. Prof. E. H. Hoppert, Department of Horticulture, Lincoln, is secretary.

TO STIMULATE the movement of American agricultural products in Europe, with special reference to fruits, small grains, cotton, meats and meat products, the Federal Bureau of Agricultural Economics will open in the near future an office at either Budapest, Hungary, or Vienna, Austria.

G. C. Haas sailed for Europe on January 3 to interview officials of foreign governments and to assist in reporting upon the potential demand for American agricultural products. After conferences at Berlin with W. A. Schoenfeld, who is engaged in correlating the work of the European representatives of the federal bureau, Mr. Haas will take charge of the office to be opened. He will also assist with statistical investigations now under way in connection with several lines of work that will be undertaken.

Pruning Bush Fruits and Brambles

COMPARATIVELY little time is spent in the ordinary small fruit garden in pruning and training the plants. They are allowed to grow up too thick and rank, to the detriment of the future crop. It has been shown, however, that proper pruning and training increases the quantity of the fruit by as much as 30 per cent and that the quality is also improved.

Pruning and Training Defined

While the two terms are often used interchangeably and misunderstood, there is a distinct difference between them. Pruning is defined as the removal of some part of the plant. Training is defined as the exposure in some definite manner of the various parts of the plant above ground. Pruning is in effect a thinning process. It has been said that training regulates the plant while pruning regulates the fruit. As a rule, the bush fruits and brambles are pruned in such a way that they require no support to be trained upon. Exceptions include the trailing brambles, such as loganberries and dewberries and raspberries, in some instances when allowed to grow very vigorously.

Reasons for Pruning

Pruning is practiced to keep the plants opened up to light and air, to reduce competition through the cutting out of surplus plants in and between the row, and to make the seasonal operations of cultivation, disease and insect control, and picking easier.

Things to Know Before Pruning

To prune intelligently one must know the growth and fruiting habits of the kinds and varieties concerned. One should also know the most favorable time to prune and have on hand the correct tools. Pruning shears and pruning hooks of the best steel only should be considered. An acquaintance with the soil treatment being followed in plantations where the pruning is being done is necessary in order that the correct amount of fruiting wood be left.

Currants and Gooseberries

Currants and gooseberries are usually trained to the bush form rather than the tree form; hence they are commonly called bush fruits. They bear their fruit just at the base of the previous season's growth or on short spurs on older wood. These spur-like growths are comparatively short-lived. The best fruit is borne on young wood not over three years old. Warm, pleasant days in winter offer the best time for pruning the bush fruits. Annual pruning is best. If the bushes are regularly cared for it will be necessary only to cut away the oldest wood, leaving about six to eight yearling shoots well distributed over the bush each season. These shoots are gray in color and usually straight, with no lateral growths. Wood from one to three years old will then be left. This will bear as much fruit as the plant can mature properly. Vigorous, well-cared-for plants may have a small amount of four-year-old wood. If the plants have been neglected for several years, little yearling wood will be found. The bush will be filled with old, dead canes. The annual growth at the ends of the shoots will be weak and the fruit will be poor in quality and small in size. The oldest wood should be removed and the bushes opened up to light and air. If they are well fertilized and sprayed to rejuvenate them, good crops may be expected again. Gooseberries are more vigorous growers than currants, tending to branch laterally on terminal growth of the same season. This habit of growth makes for a compact bush. More wood must, therefore, be cut away from gooseberries to keep them open. Few gooseberry plants are pruned severely enough.

Pruning the Brambles

Raspberries and blackberries are plants with more or less perennial roots and with biennial tops. The fruiting cane which will bear fruit in 1925 grew in 1924. The fruiting cane which grew in 1923 bore fruit in 1924 and then died. Pruning the blackberry as a rule involves (1) the removal of the dead canes as soon as convenient after they have borne fruit in summer; (2) the thinning out of surplus plants and the cutting back of those remaining in the plantation during the dormant season; and (3) the tipping of the young growing shoots in spring as they reach a height found best for the particular locality, usually about 20 inches to two feet.

Blackcaps and purple canes are handled in much the same manner as blackberries. Red raspberries should not be tipped in late spring.

We have found in Illinois that blackberries should remain about a foot apart in the row after the winter pruning is completed. Better crops of quality fruit are produced where comparatively severe pruning is practiced. The laterals on the canes which remain are cut back approximately one-half. Slightly more fruit is produced if they are not cut back so severely but the quality and size were found to be inferior from experimental work carried on at Urbana, Ill.

Tipping of the young blackberry canes is done twice, at about two-week intervals, in order to get the majority of the shoots as they reach a height of about 20 to 24 inches. This operation induces lateral branching and makes for stocky tree-like growth.

Black raspberries are grown in hills rather than in hedgerows. The number of canes to leave in each hill will vary, depending upon the vigor of the variety and the type of soil. If the plants are small only a few canes should be left when the dormant pruning is done. Large plants in good soil can support four to six canes each. In any case the laterals should be cut back severely at least to where they begin to arch over and droop.

Removing the Mulch From the Strawberry Patch

THE MULCH should be allowed to remain as long as possible in the spring, the length of time being regulated by the behavior of the plants, which should be carefully watched. The mulch should be left as long as the plants remain dormant. As soon as the first leaves begin to appear, the material should be partially raked off the rows into the middles and well trampled down. A portion of the material may need to be removed from the patch. The plants should be allowed to grow up through the remaining mulch.

We are indebted to the California Walnut Growers' Association for the loan of the plate from which this cover is printed, and we wish to take this means of thanking them for this courtesy.

Pedigreed Fruits

SO-CALLED "pedigreed" or "improved" nursery stock is scarcely ever superior in any way to stock of the variety from which it is derived, according to horticulturists at the New York Agricultural Experiment Station, Geneva.

Propagation of hardy fruits by cuttings or grafts almost never leads to any permanent change in the variety, declare the station fruit authorities, such change being brought about only through propagation by seeds which are the result of cross pollination or which make it possible for inherent differences in the fruit to be expressed in the seedling. Mere vegetative propagation simply gives the same fruit in every respect as the parent stock. Of the many so-called "improved" varieties of fruits tested on the station grounds at Geneva not one has differed in any way from the original variety, it is said.

Differences in a standard variety of fruit are sometimes brought about by growing the variety in different soils and under different climatic conditions, and these differences are often described as new or improved characteristics of the variety and are believed by some to be permanent improvements. Such changes will disappear on other soils or under other environments, say the specialists.

Truly new fruits such as those put out by the station fruit breeders are seedlings obtained from crossing different varieties and which have been subjected to the most rigid testing and selection before they are offered to the fruit grower. Such fruits are really new and represent permanent improvements in some respect which will be perpetuated wherever the variety is grown.

Pollination and the Dropping of Apples

(*Continued from page 8*)

weak to hold them, use pruning and better cultural methods to produce wood of the kind which holds and matures the fruit.

Bear in mind that growth and fruitfulness are closely related. Give your trees the kind of treatment that will promote the right kind of growth. Plant the right kind of varieties together in order to secure cross pollination, and use bees if necessary, for the purpose of securing proper distribution of the pollen.

Insects and Diseases Which Attack the Strawberry

THE STRAWBERRY is so universally grown that it is only natural to expect that there would be quite a number of important insects and diseases attacking this crop. However, they are not so serious but that they respond to a little common sense treatment. A few precautions go much farther than a large amount of cure in the case of the strawberry pests. The first thing to always remember is to get good plants. These should be strong plants, with good vigor, and disease and insect free. A good price paid for such plants is money well invested. Many growers make the mistake of going to old worn-out beds that are badly infested with insects and diseases, and take from them weak, devitalized plants and they hope to start in the strawberry business with such a stock. It cannot be done. It is only with a vigorous, strong plant which will pass inspection that one can hope to get a reasonable start.

The second step which will go a long ways in controlling the pests of the strawberry is to choose the land upon which they are to be planted with care. In the first place, the strawberry is a crop which should always be rotated. Never plant new plants where an old bed has been growing but grow some other crops for three or four years and plant your strawberries somewhere else. Neither is it wise to plant strawberries immediately following the plowing up of a sod because the ground is filled with insects which will attack the strawberry plants and will destroy them. It would be better to grow some hoed crop, like potatoes or corn, for a year before planting the strawberry.

The White Grub.

Naturally all strawberry growers are familiar with the large, dirty white grubs with brown heads, which will attack the roots of strawberries, causing the plants to wilt. These grubs are the larvae of the May beetle. The female lays the eggs in

(*Concluded on page 50*)

Figure 3—Varieties or trees which make a poor early season growth, as is common in Winesap (left), cannot be expected to set fruit as well as those which make a stronger growth, like Stayman (right)

By H. A. Bittenbender

Two Causes of High Mortality in Brooding Chicks

A HIGH mortality often occurs among young chicks. Of the various diseases which may cause such a result, Bacillary White Diarrhea and Intestinal Coccidiosis occupy a prominent place. It is worth while, therefore, to know the causes, symptoms, and methods of controlling or preventing these diseases.

Bacillary White Diarrhea

"White Diarrhea" is a term applied to either of two diseases which have similar symptoms but different causes. Bacillary White Diarrhea is a common disease in the East, but it is not a serious menace yet in western sections. Intestinal Coccidiosis is apparently more common and is probably one of the serious causes of the heavy mortality of chicks every year. It is a highly infectious and unusually destructive disease and is becoming a greater menace each year. It usually affects chicks from five days to three weeks of age.

Symptoms: Affected chicks stand about in a stupid, indifferent way, isolating themselves from the rest of the flock and eating little or no food. They progressively lose weight and have the characteristic diarrhea. "Pasting up behind" is common and often results in many chicks constantly uttering a shrill cry of pain. Recovery is infrequent.

Intestinal Coccidiosis

Post Mortem Symptoms: The liver and "blind guts," or ceca, are often visibly affected. In acute cases, the lesions may be only a thickening and congestion of the tip of one cecum. In lingering cases, there may be an invasion of the entire length of both ceca, inflammation of parts of the large intestine, deadening of tissues of liver in characteristic concentric circles and infection of oviduct, spleen, and other organs. Post mortem examination is only an indication. The surest evidence is to find the stages of coccidium in association with the lesions in the walls of the intestine or ceca or in the droppings.

Cause: This disease is produced by small protozoan parasites. Usually the disease is spread by sac-like growths containing organisms which pass out in the droppings of the diseased bird. These contaminate the food which is taken in by the other birds. The walls of these sacs are ruptured in the intestine, and the small organisms penetrate the cells lining the intestinal tract and ceca. Here they rapidly multiply. Death occurs as a direct result of mechanical injuries to the linings of the alimentary tract and because openings are made for the entrance of bacteria to the ceca, liver, lungs, and tissues of other organs.

Transmission: The disease apparently spreads by the contamination of the food and possibly through the eggs, either internally or externally.

Control: Preventive measures are recommended as follows:

1. Isolate sick birds and burn dead birds promptly.
2. Use new ground each year for raising the chicks.
3. Avoid overcrowding chicks, especially in brooders.
4. Disinfect often and thoroughly with compound cresol solution (five per cent).
5. Use one 7.3 grain mercury bichloride tablet per gallon of water in a non-metal container. Use only when disease is present and then not more than 10 days at a time.

Sanitation

In the care of baby chicks, cleanliness is one of the most important essentials. Cleanliness should not only be exercised in the care of the drinking vessels, but should be extended to all the surroundings. Particular attention should be taken that the litter covering the floor of the brooder house is absolutely free from mold and dust. Only the cleanest and brightest straw or chaff should be used. Extreme care should be taken if either clover chaff or alfalfa leaves are used that these are not moldy. If there is any question that the litter may be moldy, it is best to use a formalin solution and spray the litter thoroughly before the chicks are put under the brooder. A blanket or cover can be thrown over the litter after it is sprinkled for 30 minutes and then removed, and the heat of the brooder stove will soon dry out the litter.

The formalin solution can be made up as follows: One pint formalin to 30 gallons of warm water.

It is amazing how rapidly chicks die from being forced to breathe the dust rising from moldy litter.

Feeding

Particular attention should be paid to the appetite of the chicks. If they appear to be sluggish and inactive, it is a sure sign that they have been overfed. For the first few days keep the chicks active, scratching and working by feeding small amounts that they can clean up in a short time. Small amounts of feed given five to seven times a day is not a waste of time but a safeguard against overfeeding.

Next month the writer will discuss ways and methods of feeding.

Ban Continued on Almeria Grapes

LAST spring we raported that the importation of Almeria grapes from Spain had been prohibited by the Federal Horticultural Board because of the danger of introducing the Mediterranean fruit fly.

The exportation of these grapes to the United States has been a serious factor with the Almeria growers and the Spanish government has been assisting the growers, with the object of getting the quarantine raised. As a result, a vigorous clean-up campaign has been conducted the past season, in which many vines and trees which were infested by the fly have been destroyed. Following the request of the Spanish government, an American agent was recently sent to Spain to examine the work done and to inquire into the present status of the infestation. Dr. W. M. Mann was the agent for the United States.

While the clean-up campaign was found to have been quite helpful, it has not entirely eliminated the pest, especially in the outlying sections of the infested district. It has been decided by the Federal Horticultural Board, therefore, to make no changes in the ruling for the present. Consequently Almeria grapes will not be imported into the United States in the immediate future.

As soon as you have read this issue of the American Fruit Grower Magazine, please pass it on to your neighbor.

How About the Japanese Beetle?

(*Continued from page 4*)

sweet corn, apple, quince, peach, plum, cherry, string bean, lima bean, asparagus, soy bean, clover, alfalfa, raspberry, blackberry, grape, rose, Japanese rose, Virginia creeper, althea, fern, hollyhock, canna, elm, oak, horse-chestnut, and willow. These, however, are only a part. The list includes scores of others.

Habits of the Beetle

The feeding season of the beetles covers most of the summer. In the territory that they now occupy, the adult beetles begin to appear about the end of June, become abundant by the latter part of July, are excessively numerous all through August, are still on hand in considerable numbers in September, and even continue a little into October. No single individual lives all of this time. The individual adult may live a week or two, or it may live for six weeks or even more. But the beetles keep on coming from their cells in the ground, where their transformation takes place, some of them arriving early, some late, and all the way in between.

Like the common rose chafer, the Japanese beetle has a fondness for the blossoms of flowers and for ripe fruit. On apples that ripen early, such as Early William or Transparent, and on early peaches, the beetles cluster so thickly that fruit may be completely covered with them. They gnaw holes in the surface of it and totally ruin it. Where plants are in blossom they attack the petals and other flower parts, riddling them. When they feed on leaves, which they do very freely, they eat the surface of the leaf, leaving only the skeleton network of the veins. The leaves then turn brown, die, and drop off.

After the female beetle has been feeding for a week or 10 days, it begins to lay eggs, depositing these in a burrow just below the surface of the ground. For this purpose it prefers moist but not wet ground which is growing up to grass or weeds. From each egg emerges a little grub, which begins feeding on plant roots and on vegetable matter that it finds in the soil.

By the time the cooler weather of October arrives the grub is two-thirds grown or more, and before winter is at hand it descends in the ground to a depth of several inches. There it makes an earthen cell, in which it passes the winter. In the spring it ascends to the region of plant roots and again feeds for a time until it is full-grown. It then prepares a cell for its transformation, and in this it changes to the pupal stage. In about two weeks the adult is ready to emerge and makes its way out to the surface of the ground.

The feeding of the grubs on plant roots constitutes one of the items of injury. In lawns, in golf courses, and in other places the work of the grubs the past season has been only too evident. At first it was thought that the grubs would not cause serious damage, but now we know that this is not true, though it is the adult, of course, that does the greater part of the damage.

Description of the Adult

The adult is readily recognized and once seen is easily remembered. It is a chunky insect, about the size of the common potato beetle but more narrowly oval toward the posterior end. It is really handsomely colored. The front part of its body, including its head and thorax, are irridescent green with bronze lights, while its wings, which cover the rest of the body, are a rich brown, shaded slightly, with green along the edge. Along the sides of the body, and extending around the posterior just beyond the tips of the wings, extends a row of conspicuous white spots. The beetle is exceedingly active in warm weather and in sunshine, taking wing at the least alarm. In cold weather or on rainy days it is sluggish.

The grub, which feeds in the ground, is about an inch long when it is full-grown. Its head is yellowish or light brownish in color and its body is more or less white, but dark-colored toward the rear end. It looks a good deal like the grub of the common May beetle found everywhere in grass land, but it is somewhat smaller.

Co-operative Program Being Followed

The corps of experts who are at work on this insect are sparing no effort to retard its spread and to find ways of fighting it. They represent a co-operative program maintained by the United States Department of Agriculture, and the states of New Jersey and Pennsylvania. All are working together.

The Japanese beetle feeds on the silk of corn and hides within the husks

There are some very large and important nurseries located in the territory in which the beetle is found, and it has been a difficult problem to find the right way of safe-guarding some of the nursery stock so that grubs of the beetle would not be carried along with earth around certain classes of plants. After laborious and thorough experiments, ways have been found of accomplishing this. A treatment has been devised by which an emulsion of carbon bisulphide is used to soak down the soil around the roots of plants as they stand in nursery rows and to treat the balls of earth around plants raised in pots. Recent discoveries also utilize the vapor of carbon bisulphide, exposing the roots, while at the same time protecting the tops by inverting them in a tank of water.

Regulations Being Enforced

Carefully worked-out regulations are in force and they are being administered under the immediate direction of thoroughly trained men. It was agreed that any treatment laid down for nursery stock shipped with earth around the roots must be absolutely certain; otherwise the earth must be removed from the roots. This is necessary because of the fact that grubs of the beetle are very likely to be in such earth, close to the plant, in the season when nursery stock is dug and shipped. In fact, it is pretty sure that the beetle came to this country in just that way.

But the task of treating earth around the roots of plants in such a way as to kill insects without hurting the plants was a puzzling problem. Only recently have methods been worked out that appear to offer a safe solution.

That the precautions that are being taken are thorough will be evident when you realize that the requirements include such points as the following, for example, applying to perennials with matted roots:

1. Plants must not be placed in water previous to treatment, nor can they be dug for treatment immediately after a rain.
2. If the roots are in large clumps, they must be broken up.
3. The roots must be kept at a temperature of at least 70 degrees for not less than 24 hours before treatment.
4. The roots must be kept at 70 degrees for at least 48 hours after treatment.
5. The temperature of the carbon bisulphide emulsion must not drop below 70 degrees while treatment is going on.
6. The emulsion must be discarded and the tank cleaned out after each treatment.
7. The tank must be kept tightly covered while treatment is in progress.

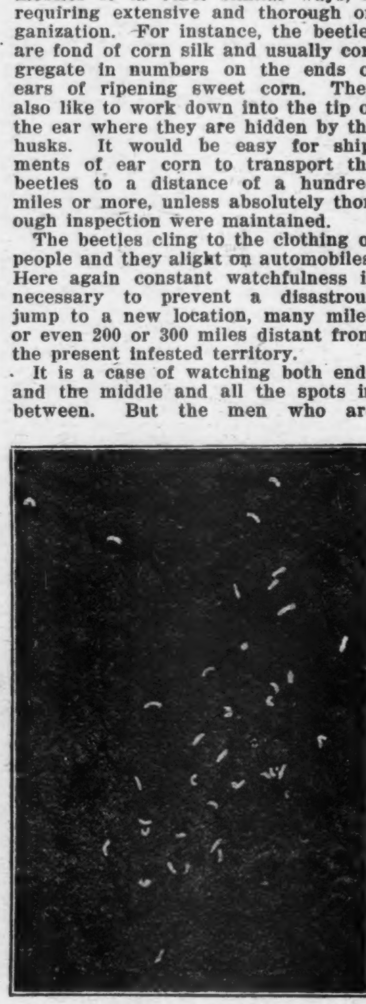
In the case of other classes of plants, similar thorough regulations are in effect.

Precautions Being Taken to Prevent Spread

The maintenance of quarantine, to prevent the beetle from being carried long distances in vegetables or automobiles or in other similar ways, is requiring extensive and thorough organization. For instance, the beetles are fond of corn silk and usually congregate in numbers on the ends of ears of ripening sweet corn. They also like to work down into the tip of the ear where they are hidden by the husks. It would be easy for shipments of ear corn to transport the beetles to a distance of a hundred miles or more, unless absolutely thorough inspection were maintained.

The beetles cling to the clothing of people and they alight on automobiles. Here again constant watchfulness is necessary to prevent a disastrous jump to a new location, many miles or even 200 or 300 miles distant from the present infested territory.

It is a case of watching both ends and the middle and all the spots in between. But the men who are charged with the responsibility are doing just that, and up to the present, so far as we know, they are succeeding.



More than 30 grubs of the Japanese beetle brought to light by digging up an area of ground two feet square

Beneficial Insects Introduced Into California

IN CALIFORNIA'S fight against black scale, the University of California has imported a parasite from South Africa and liberated it recently in a citrus grove near Whittier. It is an internal parasite which attacks the scale in the more mature or "rubber" stage. The name of the critter is *Coccophagus modestus*. We do not know exactly what that stands for, but any insect with that name ought to be able to do the work.

The University has also imported from South Africa a new species of ladybird beetle *Oenopia cinctella*, which is said to thrive on aphis and mealy bugs. Several other species of ladybird beetles have likewise been imported recently for the purpose of combating mealy bugs. Some of these are reported to be effective against red and purple scale as well. The importation of these insects has taken place under the direction of Harry S. Smith, of the University of California.

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Baldwin Apples Unchanged by Environment

By U. P. Hedrick

New York Agr. Exp. Station

IN 1911, 84 Baldwin apple trees were purchased from 42 different locations in the United States to determine whether distinct strains of this variety have originated under different environments, and if so, what the value of the several strains may be. These trees have been in bearing for several years and we are now able to give the results of this experiment.

As all know, the Baldwin apple is widely distributed in the United States, possibly more widely distributed than any other variety. The 84 trees used in this experiment came from 42 nurseries scattered throughout the United States, from the Atlantic to the Pacific and from the Gulf to the northern boundary of fruit growing in Canada. An effort was made to get representative trees from as many localities as possible and to have them propagated from Baldwins long grown in the different localities.

The experiment was started to throw light on the rather common belief that fruit growers hold that the Baldwin apple is undergoing a change in different locations. Some believe that the variety has been improved under some environments, notably those of Canada and New England, while others and the majority maintain that under southern and western conditions the Baldwin has degenerated. Not a few accept the dictum that "all varieties run out with age" and assume that the Baldwin is not as good an apple in tree or fruit as it once was because of the age of the variety.

In this experiment all of the trees from different localities are producing fruit similar in size, color, season, and quality. Fruits from trees brought from California, Virginia, Alabama, Canada, Iowa, New York, and all other regions, although they may grow differently in these different parts of the continent, all snap back into the original Baldwin when brought together under identical conditions. This experiment does not show that we may expect this apple, and presumably any other apple, to be changed in the least because of having been grown in diverse situations, nor may we expect, from the showing made here, that the Baldwin, or presumably any other apple, is degenerating through the age of the variety. And lastly, since all of these trees, according to the accounts of the propagators, were budded from nursery stock, it does not seem to follow that this apple, or apples in general, deviate from the type because nursery stock and not bearing trees furnish the buds.

It remains to be said that there are at least three types of Baldwin apples in different parts of the United States. It does not seem from this experiment, however, that they have necessarily originated because this fruit was grown in three different environments. Of course, the experiment throws no light on how these strains may have originated, much as it was hoped that the experiment might do in furnishing knowledge as to how variations and sports of this and other fruit arise.

Sweet Cherry Pollination

STUDIES of sweet cherry pollination in the Northwest have revealed that some of the best varieties, such as Bing, Lambert and Napoleon, are not only self-sterile but are inter-sterile with each other. Two of the best varieties with which to pollinate the above are Long Stem Waterhouse and Black Tartarian. C. L. Long of Oregon and M. D. Armstrong of Washington are demonstrating the top-working of some of the commercial plantings to these pollen-producing varieties. H. B. Tukey of the Hudson valley section of New York reports results which agree pretty closely with western results. Considering these results, it does not seem advisable for growers to maintain solid plantings of the Bing, Lambert and Napoleon cherries.

Recent Rootstock Developments

(*Continued from page* 10)

plete reversal should occur in one year's time cannot be explained, unless it be that large almond acreages have been opened up on soils that are more suitable for the peach root than for the almond root.

Peach Gaining as Stock for Apricots, Plums and Prunes

In looking at the figures for the apricot we find some marked changes. The apricot and Myrobalan roots have been losing in favor each year while the peach root has been gaining. This may be accounted for by one of two reasons, first, fewer apricots being planted on the heavier soils which require either the Myrobalan or apricot root, preferably the former, and, second, relatively larger plantings going on the lighter soils which require the peach root. Although the almond root was used at one time for adapting the apricot to the light soils, it has been discarded in view of the lack of affinity existing between stock and scion. It will be noted that 1.3 per cent of the apricot stocks for 1923 was the Davidiana, or Chinese peach. This is another new stock that is being given attention by nurserymen and growers. This stock is highly resistant to alkali in the soil. Whether the apricot will be a success on it is yet to be seen. If so, the soil types adaptable for apricot growing will be increased.

Two distinct changes have occurred in the demand for plum rootstocks. First, the demand for the plum on Myrobalan root has been gradually decreasing, and, second, the demand for the plum on the peach root has been increasing, especially during the year 1923. It will also be noted that the demand for the apricot and almond roots has fallen off to a slight degree. Although the Myrobalan was the standard root for plums some years ago, it has been losing in favor during recent years, caused probably by the great variations existing in the Myrobalan seedlings. Nurserymen have taken cognizance of this variation and are now endeavoring to establish types that will not vary. At the present time there is a mixture of numerous types. The problem on hand is to isolate these various types and try each one separately as a rootstock. Although all plum varieties cannot be worked successfully on the peach root, as, for example, Santa Rosa, Diamond, Kelsey, and President, there appears to be an increasing demand for plum varieties on peach root where it is known that affinity exists between stock and scion. No doubt the large plantings of plums that are being put on the lighter soils accounts for the increase in demand for the plum on peach root. The figures for the plum on almond root indicate that this root finds little demand as a stock for the plum. There are many old almond trees grafted to plums, but as a general rule very few plums are budded on almond stock by the nurserymen.

Somewhat similar changes have occurred with the prune stocks as have occurred with the plum stocks. The Myrobalan has been in less demand while the peach has been in relatively greater demand than in the past. The apricot and almond seem to be the "weak sisters." Little affinity exists between most of the prunes and the apricot root. The Sugar prune seems to make a good union, but doubt exists as to the affinity existing between the French prune and apricot root. There are cases on record where the union is successful and other cases where the opposite is true. It will be noted that the prune is to be given a trial on the Davidiana root. The changes in stocks for the prune seem to be somewhat similar to the changes occurring in the demand for the plum stocks. This would naturally be expected in view of the fact that all prunes are plums. During the past few years a considerable amount of evidence has come to hand to the effect that prunes on Myrobalan root are more susceptible to red-spider attack than prunes on peach root. (This opens up the old question of whether the root affects the top in a qualitative or quantitative manner.) This, together with the fact that large plantings of prunes are going into the lighter soils, probably accounts for the decrease in demand for the Myrobalan root and increase in demand for the peach root.

Peach Roots Most Popular for Peach

Little change has occurred in the demand for the peach stocks. Peach on peach still seems to be the best combination. The demand for the peach on almond has slightly declined. Although 1.4 per cent of the peaches in 1922 were budded on apricot root, only 0.2 per cent were on this root in 1923. This is probably a change for the better, for it is a well known fact that little affinity exists between the peach top and apricot root. The reason for some growers demanding the peach on the apricot root is because the apricot is practically immune to nematode attack while the peach root is very susceptible. Many of the nematode problems affecting our peach orchards in certain sections of California, particularly the San Joaquin valley, could, no doubt, be solved if it were possible to grow the peach on the apricot root. It appears as though the only and most logical method for combating the nematode in peach orchards is to find some other resistant stock on which the peach can be successfully propagated. Soil and chemical treatments seem to be ineffective in our orchards. Although 0.3 per cent of the peaches propagated in 1922 were on the Myrobalan root, none were reported on this root in 1923. Here again is another change for the better, as poor results are generally secured when trying to adapt the peach to the Myrobalan root. It will be noted that 0.56 per cent of the 1923 peaches are propagated on the Davidiana root. Here again little can be said as to the behavior of the peach on this root, although some success has been had in the past with this combination. Although some of the above percentages appear to be small, the writer would like to call the reader's attention to the fact that these small percentages represent large numbers in view of the fact that millions of peach trees were propagated in California during the past year.

French Pear Roots Overtake Japanese for Pears

In the article referred to in the opening sentence of this article, the writer predicted that there would be a marked revision in the demand for the various rootstocks used in pear propagation. An examination of the percentages in the table for pear stocks shows this to be true. The Japanese pear has lost considerably while the French has gained and overtaken the Japanese (this includes the 9.2 per cent Old Home on French root, which will be discussed later). The reason for this revision can be traced directly to the question of pear blight. Not so long ago it was believed that the best stock for the pear was the Japanese, due to its seeming resistance to pear blight. However, numerous cases have appeared during recent years where blight has taken a heavy toll of Japanese roots. On the other hand, it has been shown that the French root is not as susceptible to blight as was originally believed. Also, the Japanese root has made a poor record in wet soils, while the French seems to do well under such conditions. These factors account for the revision of figures which has occurred during the past year. Referring to the table again, it will be noted that the quince stock is gaining in favor from year to year, 9.9 per cent of all pears reported last year having been propagated on this root. It will be interesting to see whether this condition will exist for another year. There is no doubt but that dwarf pear trees have their place among our orchards. No report was made in 1923 of pears on Calleryana root. However, some interesting new features are noted in the 1923 figures, namely, Old Home on French, Old Home on Ussuriensis, and Ussuriensis. The Old Home is a blight resistant type and is being used as a framework for the commercial variety. By working on a resistant stock, we have a tree made of three parts, the top bearing the commercial variety, such as the Bartlett, the framework (Old Home), and the roots, the latter two of which are relatively or practically resistant to blight ravages. The Ussuriensis, a Chinese species, has given promise as a blight resistant pear stock, provided the proper strains are secured. There appears to be a mixture of several distinct types in this species. It is thus seen that the fluctuations in the pear stock can be directly attributed to the pear blight question.

What the rootstock situation will be next year is hard to say. No doubt other interesting changes will occur as have occurred during the past few years. In order to get an insight into the rootstock situation on a larger scale, the writer aims to canvass the nurserymen of the entire country this fall. No doubt, it will be of great value and utmost interest to compare figures secured from different states and different sections. Readers of the AMERICAN FRUIT GROWER MAGAZINE may look for this report sometime next spring.

Insects and Diseases Which Attack the Strawberry

(*Continued from page* 45)

the ground several inches below the surface. The grubs hatch and feed a whole year on the roots, burrowing deeper into the ground for the winter, coming back the next year, when they do their greatest damage. It takes three or four years to complete the life cycle of these grubs. They naturally infest sod land as their food consists of grass roots. Where strawberries are planted in land which has just been in sod, the greatest damage occurs, since the grubs find their food is greatly limited and they concentrate on the relatively few strawberry roots that are left in the soil. When beds have been kept too long in the same place (three or four years), one may also expect damage from the grubs. Where plants wilt, one may dig down and get the grubs in that way but this is an expensive proposition. The way to control this insect is to not plant on sod land but to plant on land which has been in some cultivated crop and not keep your strawberries too long in one place.

Leaf-Roller.

The leaf-roller at times causes very serious damage in strawberry beds. The adult insect is a reddish-brown moth. The larva which does the damage is a yellowish or greenish-brown caterpillar. After feeding for a short time on the upper surface of the leaf, the caterpillar draws the edges together with threads and fastens them into a little case and begins to feed on the inside. Where the caterpillars are numerous and attack a large number of the leaves in a short time the leaves turn brown and the bed has an appearance as though fire had passed over it. The insect winters in trash about the bed and will sometimes return to the leaves for a short time before pupating.

Arsenate of lead put on early in the spring when the caterpillar first appears is fairly effective. One may use three pounds of paste or one and a half pounds of powder to every 50 gallons of water. This should be followed up every week or 10 days with an additional spray so that as new leaves develop they can be covered with the spray before caterpillars appear, whereas only one spray would probably attack only the early caterpillars. As soon as the crop is harvested, it is also wise to mow the bed and burn all the old leaves. In this way many of the insects are destroyed.

The Weevil.

In some seasons the strawberry weevil destroys half the crop. It may occur at any time in the strawberry sections east of the Rocky Mountains. The adult is a small weevil, reddish-brown in color, about one-tenth of an inch in length. It generally hides under trash in the winter or may go to nearby woodlands.

Just before blossoming time the adult females lay the eggs in the blossom buds, choosing those which have pollen in them. They then girdle the stem, which soon wilts, and the bud breaks off, the young larva feeding on the pollen. For three or four weeks it pupates and then emerges as a full grown weevil. A new generation will start at that time, which will feed upon the pollen of various kinds of flowers, including the strawberry.

Since this insect prefers the pollen, in sections where it is bad, one may get reasonable control by largely planting pistillate varieties and planting only enough staminate blossoms for pollination purposes. In small gardens one can cover patches with muslin about blossoming time and protect them in that way. Destroying trash in and near the strawberry bed may be one means which will help to control this insect. It is generally not bad enough to warrant a regular spray program.

The Leaf Spot.

The leaf spot is the one universal serious disease which attacks the foliage of the strawberry plant. It is commonly called leaf spot but sometimes is known as leaf rust or leaf blight. The leaves when attacked are covered with small spots or blotches. These are purplish with red borders and as they get older the centers tend to turn grey and the tissue becomes killed. Many of these spots may run together, forming large, irregular patches.

There are a number of steps one can take in controlling this disease. First, choose good soil. Plants which are put in heavy, poorly drained soil are more likely to be attacked by this disease than when planted on other locations. Second, choose varieties which are more or less resistant. Some varieties are very susceptible while others are fairly resistant. Third, spray with Bordeaux. One spray should be given about as soon as the plants start in growth in the spring, another just before blossoming, and a third immediately after blossoming.

Powdery Mildew.

Powdery mildew is another disease which occasionally is troublesome, although it is not usually so. As the name would indicate, when leaves are attacked by this disease, they take on a white, powdery appearance. Generally Bordeaux Mixture, such as one would use for leaf blight, will control this disease.

There are other diseases which attack the strawberry from time to time but they are not universal enough to need special mention at this time, and where they are largely local in character, the county agents or the state agricultural experiment stations are generally equipped to give the desired information on such insects and diseases.

MEMBERS of co-operative fruit associations will be interested to learn of the experience of the Tobacco Growers' Co-operative Association of North Carolina in enforcing contracts. In a period of six weeks recently the association succeeded in getting a favorable decision in 75 jury cases. Not a single unfavorable verdict was returned.

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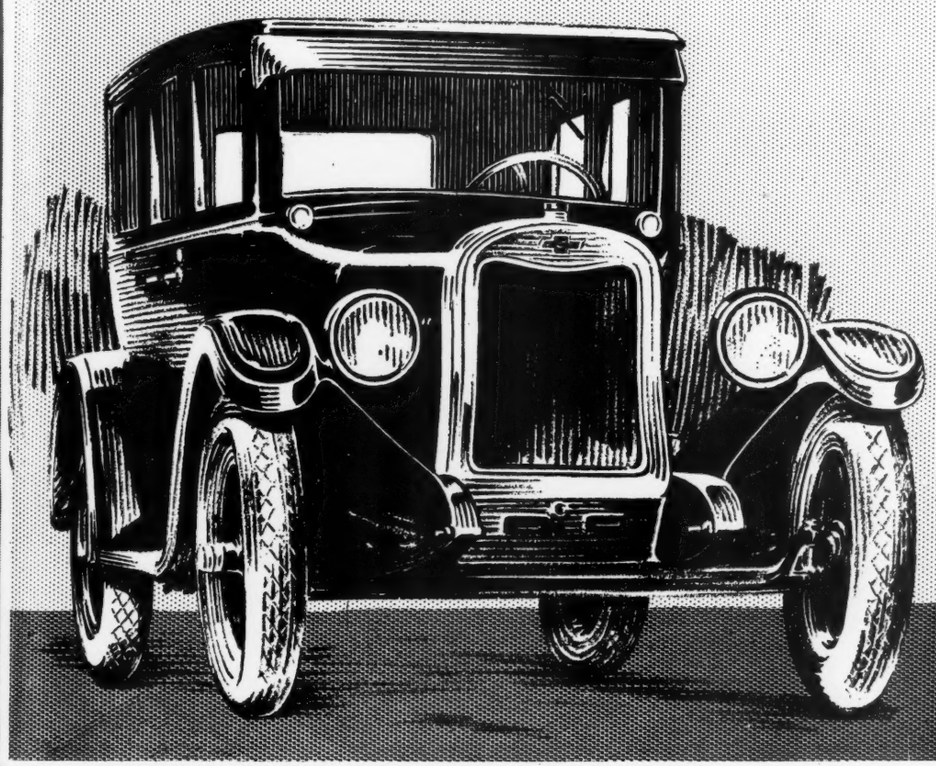

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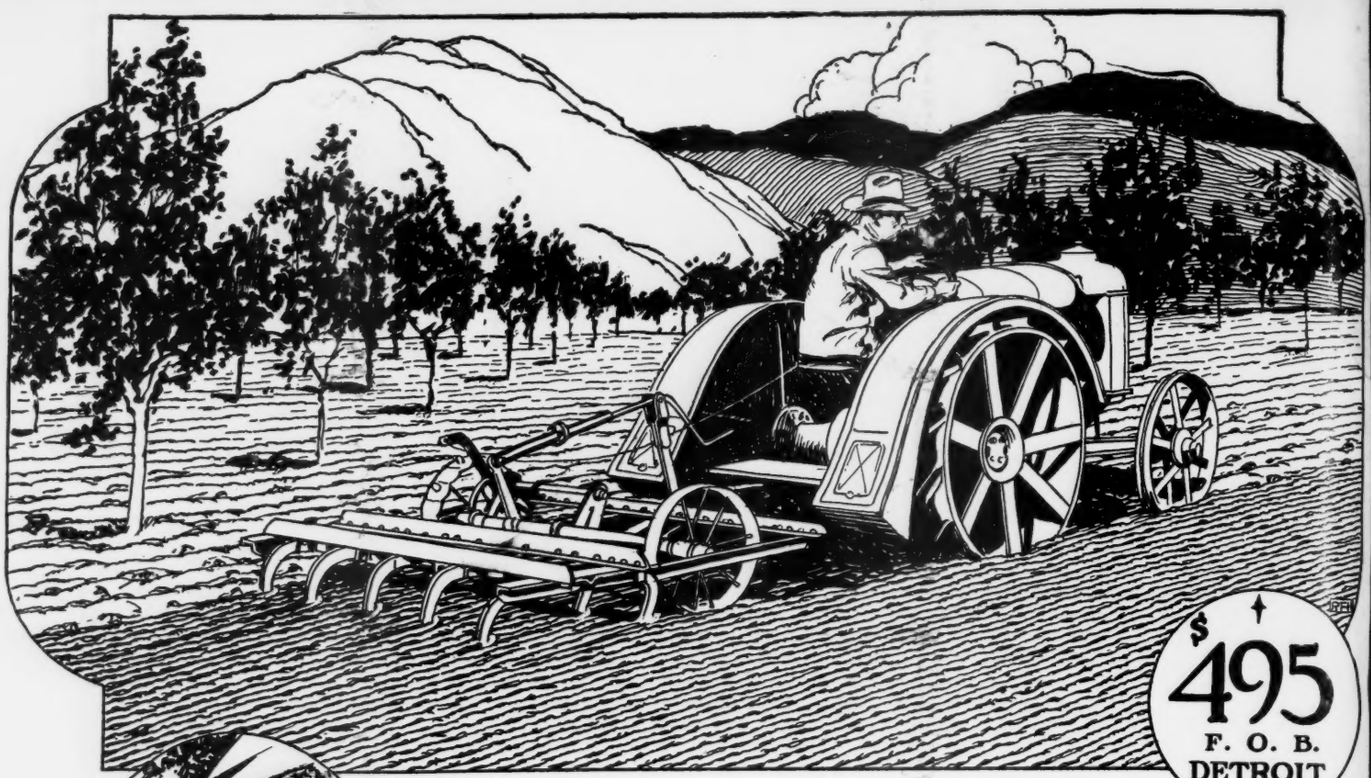

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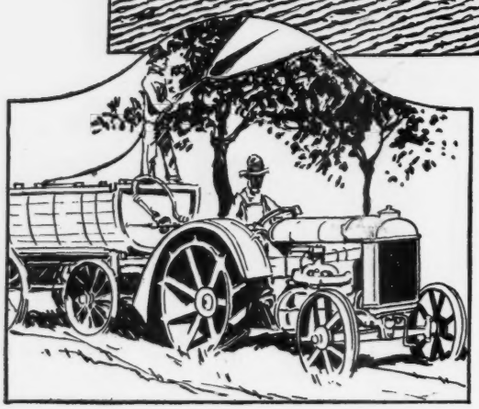

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